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THE QUANTITATIVE WASSERMANN REACTION AS A GUIDE TO THE TREATMENT OF SYPHILIS: A PRELIMINARY COMMUNICATION.

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AND

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The Need for a Quantitative Wassermann Test.

UNTIL a few years ago no quantitative reaction of sufficiently wide range was commonly used to determine the progress towards cure in a case of syphilis. It was well known that, under efficient treatment with mercury, arsenic or bismuth, or some combination of them, the clinical manifestations of syphilis in the primary and secondary stages, and many of those in the tertiary stage, readily disappeared. The patient, however, was not cured, as was shown by the relapse that took place if treatment were discontinued, and by the fact that the Wassermann reaction was still positive. Treatment was continued, therefore, until reaction to the Wassermann test no longer occurred, and thereafter for an indefinite and arbitrary period. Relapse still sometimes occurred after this period.

The practitioner treating a patient suffering from syphilis usually had some routine plan of medication in which the various antisyphilitic drugs were administered for varying periods and with varying intermissions, until it was considered safe on clinical grounds to cease treatment. At wide intervals the Wassermann test was done. If there was a reaction, the patient was considered to be still syphilitic; if not, he might or might not be cured.

It was felt that some indicator which would show the "degree of syphilization" or the progress of the case towards cure, would give much definiteness to

treatment. A quantitative reaction that could be plotted on a chart similar to a temperature chart, would show how the case was responding to treatment long before reaction to the Wassermann test actually disappeared; by performing the test at frequent and stated intervals, variations in the response could be followed and rises in the "degree of syphilization" seen before clinical manifestations of relapse declared themselves; whilst, after reaction to the Wassermann test had ceased to occur, frequent and regular determinations would show whether this condition persisted or whether changes to the positive condition occurred.

Everyone admits the mnemonic value of a graphic record. The Vernes test furnishes such a record; but it requires fragile and expensive apparatus as well as special reagents for its performance.

Vernes[1] claimed for his photometric method that it gave an accurate indication of the degree of syphilization; but the comparison made by the League of Nations[2] of the various serological methods for the diagnosis of syphilis has shown the Vernes test to be inferior to the Wassermann test. Therefore, it was decided to modify the Wassermann method used in this institute to enable us to obtain a numerical value for all sera giving a positive reaction. In this way we hoped to retain the undoubted advantages of the Wassermann reaction together with the advantages Vernes claimed for his method.

The recognized methods of carrying out the Wassermann test are quantitative to a certain degree only. Whether the test depends on determining the number of doses of complement fixed by a given amount of serum, or determining the dilution of serum fixing a given amount of complement, the results are usually expressed in terms of *plus* and *minus* signs. In none of the four methods recommended by the Medical Research Council is it possible to obtain more than five grades of reaction (++, +±, +, ±, ±). *Plus* and *minus* signs are not as suitable for recording on a chart as are numerical values.

The Quantitative Wassermann Test.

The method of carrying out the Wassermann test, as formerly practised in this institute, was based on the testing of varying amounts of patient's serum against standard amounts of antigen and complement. Patient's serum was used in dilutions of 1 in 5, 1 in 10 and 1 in 20. In an endeavour to make the test more strictly quantitative, we increased our dilutions of patient's serum to include 1 in 40, 1 in 80, 1 in 160, as well as the 1 in 5, 1 in 10 and 1 in 20 already in use.

Schwartz,[4] in his quantitative test, does not use a dilution higher than 1 in 80, while Kolmer[5] uses dilutions ranging from 1 in 5 to 1 in 200. In our series of 5,000 sera, 20% of the total number giving a positive reaction gave this result in a dilution of 1 in 80 or over, so Schwartz's upper limit is too low. However, only a small proportion of the positive sera have shown complete fixation in a dilution above 1 in 160, so we chose this figure as a convenient upper limit for our chart. This is in agreement with the figures obtained by Vedder[6] in his 281 cases giving a positive Wassermann reaction; 2·7% positive in a dilution greater than 1 in 160, and 28·6% positive in a dilution of 1 in 80 or more.

In order to save both time and reagents, all sera were first tested in a dilution of 1 in 5 only. Those showing complete fixation at that dilution were then tested over the whole range.

We regard the possible error due to zoning as slight, since in 5,000 tests where each serum was tested in dilutions of 1 in 5, 1 in 10 and 1 in 20, no evidence of zone phenomenon was obtained. In our preliminary test, using patient's serum diluted 1 in 5, the final dilution was 1 in 20. From a consideration of the tables and figures given by Eagle,[7] it is apparent that the degree of zoning likely to occur in this dilution is slight.

Where fixation was not complete in any tube, it was found sufficiently accurate to determine with the naked eye the proportion of cells unlysed, by comparing the tube with the controls, and thus to determine in what dilution complete fixation would have occurred. Where readings were made in this way, and also from dilutions at shorter intervals, they were so close as to lead us to believe that this possible error would not significantly alter the results. The reciprocal of the degree of dilution giving complete fixation was the Wassermann index of the serum tested.

A chart similar to a Vernes chart was prepared, on which the Wassermann index was plotted against time, the treatment given being also shown. In this way, by performing a Wassermann test at regular monthly intervals, a chart, similar in appearance to a clinical temperature chart, was obtained, which indicated: (i) the "severity" or "degree of syphilization" of the patient at any given time, and (ii) the progress of the case and the response to treatment. During the past two years this chart has been in use in the Male Venereal Diseases Clinic at the Alfred Hospital.

The amount of clinical material has been too small and the time since the adoption of the chart too short to enable us definitely to determine the relative value of any remedial agent or routine course of treatment, or to make any pronouncement as to the ultimate prognosis; but from among the material collected we have selected ten typical charts showing the progress of the Wassermann reaction when treatment is instituted at the various stages (that is, primary, secondary or tertiary) of the disease, and we think that they do furnish us with a plain and graphic guide to treatment.

The Quantitative Test in Primary Syphilis.

After the appearance of the primary lesions, but before the blood has developed a positive reaction.—If treatment is instituted before the blood is capable of reacting to the Wassermann test, the reaction may remain consistently absent. Chart I illustrates this course.

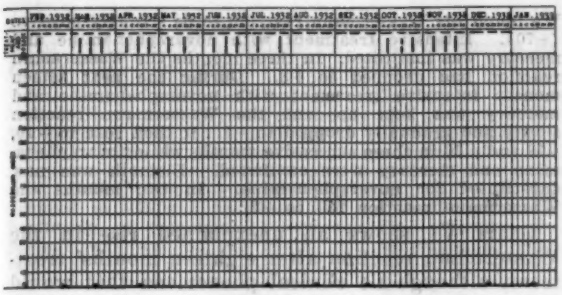

CHART I.[1]

The patient presented himself with a chancre, which had been on the penis for one month. The *Spirochæta pallida* was found in the exudate from the chancre by direct microscopical examination with dark-ground illumination. There was no reaction to the Wassermann test. Intensive treatment by novarsphenamine and mercury was instituted immediately and continued for eleven months. The Wassermann reaction was absent throughout. The chancre healed, and no other clinical manifestation of syphilis developed.

Not all patients are so amenable to treatment.

Chart II is that of a patient who had had a chancre on the penis for three days. The *Spirochæta pallida* was found by direct microscopical examination of the exudate, with dark-ground illumination. There was no reaction to the Wassermann test. Intensive treatment by novarsphenamine and mercury was instituted at once and continued without intermission. After seven months the Wassermann reaction became suddenly strongly positive (+60). Treatment by bismuth and mercury was then instituted. Three months later the Wassermann reaction had dropped to +12. Four months later still it had only dropped to +10. Novarsphenamine and mercury were again used, and after a further three months the Wassermann reaction no longer occurred. There were no clinical manifestations of syphilis to account for the rise. Without constant monthly readings of the Wassermann reaction this rise after seven months might have been missed.

After the appearance of the initial lesion and after the blood has developed a positive Wassermann reaction.—Chart III illustrates a usual type.

The patient was under treatment for gonorrhœa. One month after the commencement of the gonorrhœa, that is, five weeks after infection, a chancre appeared on the penis. The *Spirochæta pallida* was found by direct microscopical examination. A fortnight later the Wassermann reaction was strongly positive (+60). Intensive treatment with novarsphenamine and mercury was instituted. The Wassermann reaction gradually fell, and in four months disappeared. There has been practically no reaction for a year, during which time intensive treatment has been kept up.

Chart IV illustrates a very strongly positive Wassermann reaction (more than +160), the satisfactory response to treatment, as shown by the rapid fall, and also one of the unfortunate happenings incidental to intensive treatment with powerful drugs, jaundice, occurring after nine months' treatment.

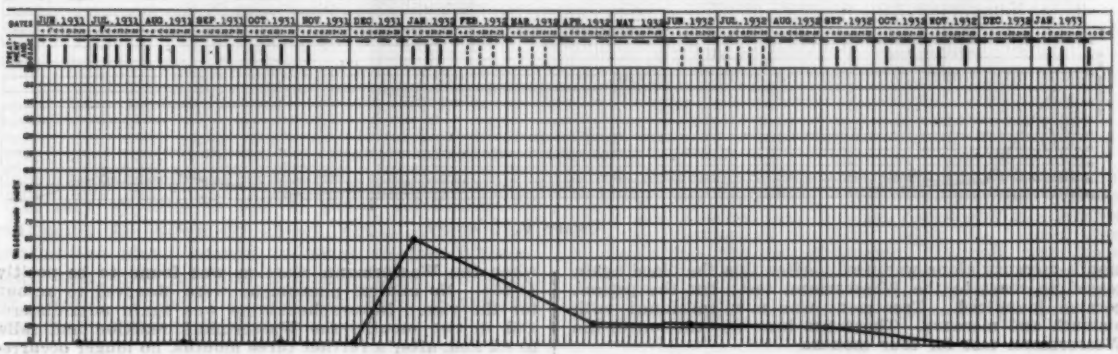

CHART II.

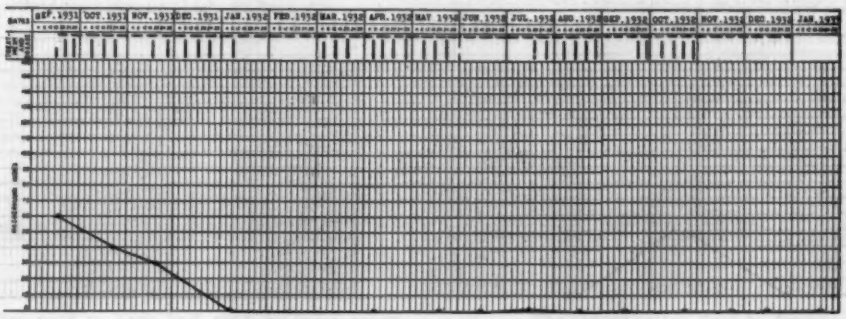

CHART III.

The patient had had a chancre on the penis for one month. The *Spirochæta pallida* was found by direct microscopical examination, and the Wassermann reaction was

[1] Explanation of the charts: In the space set apart for "treatment and dosage", a vertical line represents a single dose of 0·6 gramme of novarsphenamine; a dotted vertical line represents a single dose of bismuth (usually two cubic centimetres of "Bismol"). The horizontal dotted line indicates continuous treatment with some mercury preparation over the period covered by the dotted line.

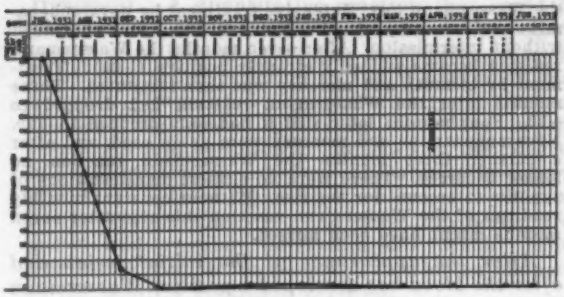

CHART IV.

very strongly positive (more than +160). Intensive treatment with novarsphenamine, mercury and bismuth was instituted. In three months the blood had ceased to react to the Wassermann test. For a further five months treatment with novarsphenamine and mercury was continued, but bismuth was omitted. During this time the Wassermann reaction showed a slight rise to +2. Then for a month mercury alone was used. After this the blood again ceased to react to the Wassermann test; but the patient became jaundiced. Treatment was now continued with bismuth and mercury. There has been no reaction to the Wassermann test for four months.

The case illustrated by Chart V is apparently more refractory to treatment. The Wassermann reaction was slow to fall and still, after twenty-three months' treatment, is slightly positive.

The patient presented himself with the scar of a healed chancre on his penis and a note from his doctor stating that his Wassermann reaction was very strongly positive. We found his Wassermann reaction to be strongly positive (+70). Intensive treatment with novarsphenamine and mercury was instituted. In three months the Wassermann reaction had dropped to +8. During the next fifteen months intensive treatment with novarsphenamine and mercury was kept up, and the Wassermann reaction slowly and gradually dropped to +3. It then rose to +10, +18 and +20 in three successive months while novarsphenamine and mercury were continued. Bismuth was now substituted for novarsphenamine. In two months the Wassermann reaction fell to +2.

Chart VI shows an unexplained rise in the Wassermann reaction after eighteen months' treatment, although no clinical phenomena that would indicate an increase in the intensity of the syphilitic process were observed, and although there had been no response to the Wassermann test for a year.

The patient presented himself in 1929 with a chancre which had been on his penis for six weeks. His blood reacted to the Wassermann test. Novarsphenamine and mercury were administered for one year. The Wassermann reaction disappeared. Novarsphenamine was then omitted, but mercury was continued for a further six months, when the Wassermann reaction was found to be positive (+40). No clinical phenomena were observed to account for the rise. Novarsphenamine was again administered, and in two months the Wassermann reaction had fallen to +2 and, after a further three months, no longer occurred.

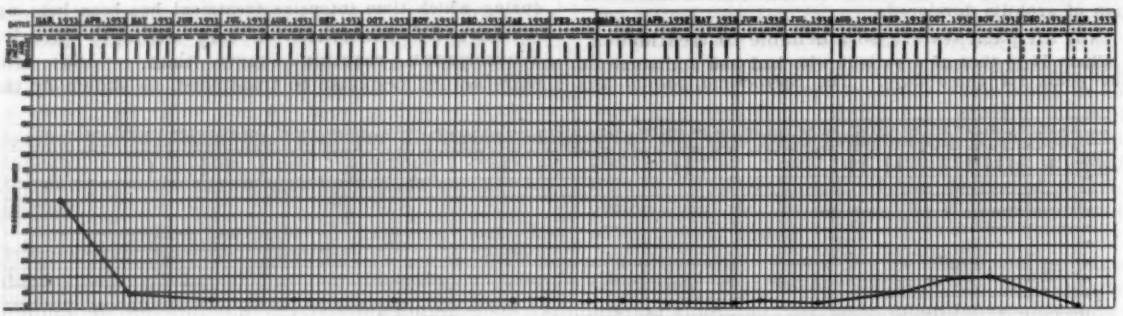

CHART V.

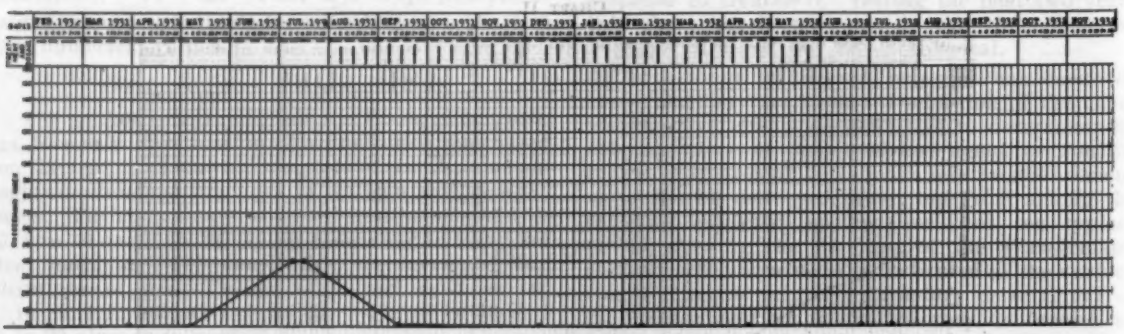

CHART VI.

Novarsphenamine and mercury were continued for a further six months, mercury alone for another two months, and now, six months after the cessation of all treatment, there is still no response to the Wassermann test.

The Quantitative Test in Secondary Syphilis.

The initial fall in intensity of the Wassermann reaction shown in the previous cases may be

replaced by an initial rise in intensity under treatment, followed by a satisfactory fall, as shown by Chart VII.

The patient presented himself complaining of loss of voice. Ulcers were present on the lip and pharynx. The Wassermann reaction was found to be strongly positive (+80). Intensive treatment with novarsphenamine and mercury was instituted. Two months later the Wassermann reaction had risen to +160, but one month later still had dropped to +10 and had been lost six months after the beginning of treatment. Now for three months the patient was out of the State, but continued to take mercury, but no arsenic. He then returned suffering from jaundice, of which the cause was not definitely determined. Treatment was now continued with bismuth and mercury. The treatment continuing, the Wassermann reaction remained absent for six months, after which the patient left the State.

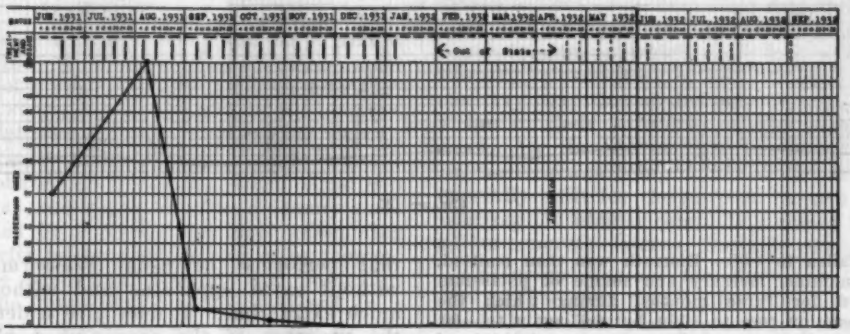

CHART VII.

The Quantitative Test in Tertiary Syphilis.

Tertiary syphilis is apt to prove refractory to treatment, as shown by Chart VIII. After four months the blood ceased to react to the Wassermann test; the reaction returned later, however, but after a further eighteen months of continued intensive treatment it disappeared.

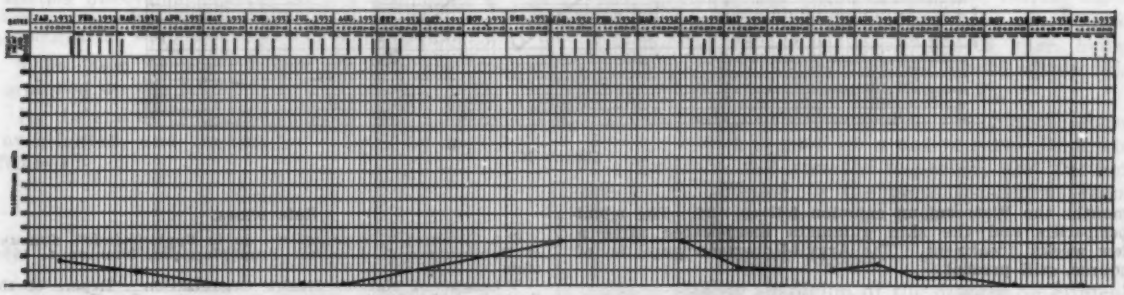

CHART VIII.

This patient was said to have had syphilis three years previously, which had been treated for sixteen days only. He presented himself with a large sore on the lip, which had been present for one month. The Wassermann reaction was found to be positive (+17). Intensive treatment with novarsphenamine and mercury was instituted. In four months the blood ceased to react to the Wassermann test; a reaction could not be obtained for at least three months. One month later arsenic was discontinued, but mercury was continued for the next three months. The Wassermann reaction was now found to be positive (+30). Novarsphenamine and mercury were recommenced and continued intensively. During the succeeding ten months the intensity of the Wassermann reaction slowly and gradually dropped till no reaction occurred. A rest from arsenic was now allowed, mercury being continued, and after two months, bismuth was given along with the mercury.

Chart IX shows a similar refractoriness. The patient was submitted to operation in the general surgical section of the hospital on account of duodenal ulceration. At operation ulceration of the pylorus and fibrosis of the liver were found, which were thought to be syphilitic. The Wassermann reaction was found to be positive (+10). Intensive treatment with novarsphenamine and mercury was instituted and continued for six months, during which time the Wassermann reaction rose to +15. Bismuth was now substituted for the novarsphenamine, and in two months the Wassermann reaction had fallen slightly to +8. Novarsphenamine was again substituted for bismuth, and in two months the Wassermann reaction had risen to +12. Vomiting now supervened. Employment of the Van den Bergh and Fouchet tests did not reveal any interference with the functions of the liver; but it was deemed wise to discontinue the use of arsenic. Bismuth was again substituted for arsenic, and, with mercury, has been continued for a further twelve months, during which time the Wassermann reaction has fluctuated between +10 and +4.

The Quantitative Test in Parasyphilis.

Chart X illustrates the fact that treatment in cases of parasyphilis holds out more hope of curing the infection and so bringing the syphilitic process to an end than we were in the habit of thinking; but, of course, degenerated neurones are not regenerated.

The patient contracted syphilis forty-five years ago. On admission to the clinic he had Argyll-Robertson pupils,

skin gummata and tibial periostitis. His knee jerks were absent and his gait and sensory phenomena indicated locomotor ataxia. The Wassermann reaction was found to be very strongly positive (+160).

Intensive treatment with novarsphenamine, mercury and iodide of potassium was cautiously instituted. After five months the Wassermann reaction had fallen to +120. A month later it was back to +160. Novarsphenamine, bismuth, mercury and iodide of potassium were now vigorously pushed. In four months the Wassermann reaction had fallen to +50. Bismuth was then omitted, but novarsphenamine, mercury and iodide of potassium were continued for three months, during which the Wassermann reaction rose to +100, but fell again to +60. Arsenic was now discontinued, but mercury and iodide of potassium were continued, and during the next three months the Wassermann reaction fell to +24. The tibial periostitis and the skin gummata disappeared after a few weeks' treatment. The Argyll-Robertson pupil is, of course, still present.

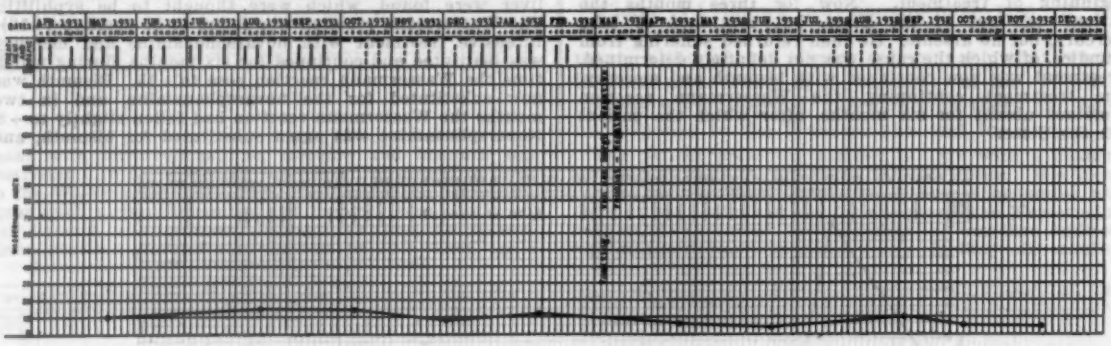

CHART IX.

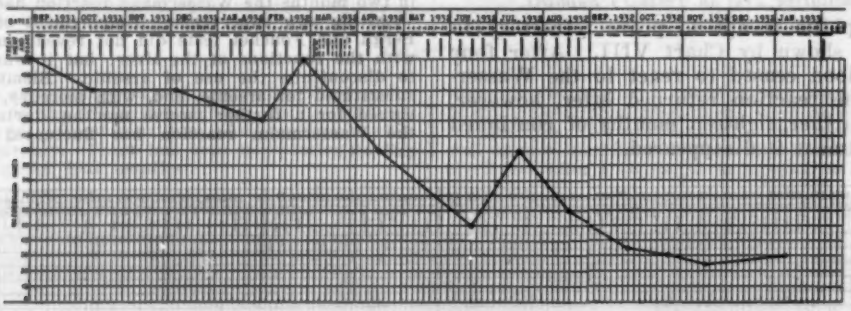

CHART X.

This case illustrates the great value of these charts in encouraging both patient and doctor to continue treatment in spite of apparent failure. This patient's Wassermann reaction was very high (+160), and even after fifteen months' intensive treatment was still +24. Now this, under the old system of recording Wassermann reactions, would be classed as +++ and without the chart it might be thought that fifteen months' treatment had been without effect on the Wassermann reaction, and so treatment might be given up in despair. The chart, however, indicates a gratifying continuous drop in the Wassermann reaction, with, one presumes, a corresponding diminution in the intensity of the syphilitic process.

Conclusion.

The quantitative Wassermann reaction as used by us is practicable. It can be done at any laboratory that performs the usual Wassermann reaction, without extra apparatus and without consuming much extra time. It does give a definite index to the progress of the case and a plain guide to treatment.

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(2) League of Nations Health Organization: "Report of the Second Laboratory Conference on the Serodiagnosis of Syphilis", 1928, page 16.

(3) The Medical Research Council of the Privy Council: "The Wassermann Test", Special Report Series, Number 14, 1921, page 3.

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(5) J. A. Kolmer: "Infection, Immunity and Biologic Therapy", Third Edition, 1925, page 486.

(6) E. B. Vedder: "The Intensity of a Positive Wassermann as a Guide to Treatment", *Military Surgeon*, Volume LXV, 1929, page 195.

(7) H. Eagle: "Studies in the Serology of Syphilis. The Cause of the Greater Sensitivity of the Ice-Box Wassermann: The Zone Phenomenon in Complement Fixation", *Journal of Experimental Medicine*, 1931, Volume LIII, page 615.

A SHORT NOTE ON THE HISTORY AND ELIMINATION OF HOOKWORM AT NAURU.

By ALAN M. B. GRANT, M.B., B.S. (Sydney),
Government Medical Officer, Nauru.

IN this short communication I hope to give the history and incidence of hookworm at Nauru and to put forward evidence that the disease is almost eliminated from the Nauruan population. We have on the island just over 1,500 Nauruans. There are 1,000 Chinese coolies here also, not under our care, and these have not yet been completely investigated, so that the conclusions of this paper relate to the indigenous population alone.

Physical Features.

The physical features were given in a recent survey,[1] so that it remains only to stress those bearing on hookworm. The island lies in longitude 167° east and 39 statute miles south of the equator. The foreshore districts consist of very sandy, porous, quick-drying soil, highly charged with tribasic calcium phosphate. In the centre of the island is a lagoon (Buada), occupying an area of twenty acres and surrounded by a fertile soil more resembling "dirt", thick with foliage and bearing many tropical fruits. These particular features are important in view of the interesting results obtained in a hookworm survey conducted six years ago by Dr. Townsend and Dr. Bray,[2] and also in the last survey.

History of Hookworm.

The first mention of hookworm affecting the Nauruans was in 1925, when the Government Medical Officer reported[3] that:

> A Nauruan was admitted to the Government Hospital suffering from anæmia, and an examination of his fæces showed hookworm ova. This is the first case of hookworm infection discovered amongst the natives. Many of the New Guinea indentured labourers, repatriated in 1924, harboured the worm and were treated for the disease.

This New Guinea labour is now no longer employed on the island.

By the end of 1926 one thousand persons had been investigated, and the results[2] were as shown in Table I.

TABLE I.

Districts.	Percentage with Hookworm.	Percentage with Whipworm.
Lagoon District	89	25
Foreshore Districts ..	41	50

The Willis flotation method was used. The adult worm was the *Necator americanus*. It will be noted how high was the infection around the damp shores of the lagoon, contrasted with the quick-drying foreshore districts. In this swampy area there lived 103 persons at this time—about one-tenth of the island population.

History of Treatment.

Campaign Against Bowel Infection.—The first treatment was a mass one at the conclusion of this survey in 1926, carbon tetrachloride being used in appropriate doses; it was dissolved in one ounce of magnesium sulphate. In 1927 three more mass treatments were carried out, carbon tetrachloride and oil of chenopodium being used in a mixture. In 1928 and from then onwards to 1931, mass treatments were carried out frequently, but at no set intervals.

Campaign Against Development of Larvæ.—The construction of deep pit latrines was leisurely commenced in 1923 before the discovery of hookworm, but was finished quickly after that time in 1925. These consist of a deep hole dug in the receptive phosphate earth, the top being covered with a concrete slab, in which there is a suitable narrow opening, closed with a lid. They are kept in a sanitary condition with sand and are later filled in. Prior to their introduction the natives used the bush. By the end of 1925 the drinking water for the natives was being collected on catchment sheds specially built for the purpose in each district, and was kept in almost completely closed five thousand gallon concrete cisterns. Suitable pumps were fitted.

Campaign Against the Entry of Larvæ to the Body.—The campaign against the entry of larvæ to the body has not been pressed, as the natives do not favour sandals. However, since 1927, they have been compelled to have a concrete platform for the floor of their houses, this platform to be raised about six inches above the level of the surrounding ground.

Segregation of Sources of Reinfection.—All the Chinese labourers on the island are brought every year from China on contract. On landing here they are put in quarantine for ten days and a mass treatment against hookworm is carried out. During their stay of three years on the island have are housed in a special compound enclosed with wire, being allowed out only to perform their work; within this enclosure they have a small Chinatown.

In regard to other measures, the general sense of public health is good for a native race. Districts are regularly and strictly inspected, and further precept is afforded to the more intelligent from films showing the life of the hookworm.

Present Hookworm Survey.

There was no suspicion of the disease on clinical grounds. All the Nauruans are inspected every six weeks, and this had not suggested the presence of any disease amongst them. Eosinophilia is moderately common amongst hospital patients, but in all cases in which it was found, it was proved to be due to filaria, over 30% of the population having microfilariasis (*Wuchereria Bancrofti*). At *post mortem* examination no suspicion of hookworm has been seen at the routine examination conducted. In the survey seven hundred persons were examined. At least 25% of the foreshore districts were repre-

sented, and absolutely every resident of the lagoon district. To avoid trickery, the patients were brought to hospital to have the medicine administered, and were kept until they had passed their own stool. The medicine used was: oil of chenopodium, 1·0 mil (fifteen minims); carbon tetrachloride, 4·0 mils (one fluid drachm); liquid paraffin, up to 30·0 mils (one fluid ounce). Fractional amounts were used for children.

Method of Examination.—Two methods were used in all cases, namely, (i) diagnosis by Barber's glycerine saturated salt method,[4] (ii) diagnosis by culture. In some cases the stools were sieved. In method number two, a small island consisting of twelve layers of filter paper was put in the centre of one-half of a Petri dish and cold boiled water was added up to a point just below the level of the island. On the top of the filter paper a portion of fæces was placed, and the whole was covered with the other half of the dish. This was left for six days. The fluid round the island was then centrifuged and examined for filariform larvæ.

Results of the Survey.—The results of the survey are shown in Table II.

TABLE II.

Districts.	Percentage with Hookworm.	Percentage with Whipworm.
Lagoon District	1 case only.	65
Foreshore Districts ..	Nil.	35

At the time of this work, there were 112 persons living on the edge of this lagoon—just under a fourteenth of the total natives on the island.

In the one case the adult forms were those of the *Necator americanus*. This patient, though infected with hookworm, was not affected by the disease. We consider that she is now cured.

It is interesting to note how the infection of Buada natives with *Trichuris trichiura* has risen to 65%, whereas it was only 25% when that district was heavily infected with hookworm; the whipworm infection of all the foreshore districts has fallen considerably.

Conclusions.

I feel that no infected person examined could have escaped this dragnet of diagnosis, and that we are justified in saying that hookworm has been almost eradicated from the Nauruans. It is instructive to note how the percentage infection was highest in 1926 around the damp, shady, and heavily vegetated shores of the brackish lagoon, and that in this survey the only case seen was found in that district. The patient lived alone some distance from the main settlement.

Summary.

1. A hookworm survey was conducted six years ago and 41% of the patients living on the dry soil of the foreshores had hookworm; 89% of those lived in the damp lagoon district.

2. In 1932 another survey revealed only one case of hookworm in the lagoon district. No others of a large number examined were infected.

3. In both surveys the variety of hookworm was the *Necator americanus*.

4. Ankylostomiasis is almost eradicated from the indigenous native population.

Acknowledgement.

In compiling this paper I beg to acknowledge the help received from His Honour the Administrator of Nauru (Commander R. C. Garsia, R.A.N.), who allowed me access to the official reports.

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INDICATIONS FOR AND END RESULTS OF TONSILLECTOMY.[1]

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THIS paper is an attempt to gather ideas of different competent observers rather than to reach conclusions from them. The subject is one about which there is still a great deal of controversy, and an enormous quantity of literature has been produced in consequence.

FUNCTION OF THE TONSIL.

Around the function of the tonsil revolve many arguments for and against its removal, so the first item is a short discussion of that subject. It is by no means a settled question. Various theories have been advanced, some of which are: (i) that it is an embryonic remain which is useless and even dangerous to the entire organism; (ii) that it is a ductless gland; (iii) that it is a blood-forming gland; (iv) that it exercises a protective function with the rest of Waldeyer's ring. The whole subject was reviewed lately, very ably, by Otto Kahler,[1] and he shows that the one definitely established fact is that the tonsil is lymphatic tissue and therefore part of the gland chain of the body, and of what is called the lympho-epithelial type, along with the rest of the pharyngeal ring and the other alimentary lymph nodes. It follows, then, that the only proven function of the tonsil is that it produces lymphocytes. Schlemmer has shown that the tonsil has no afferent lymphatics, so cannot act as an ordinary lymph gland with a flow of lymph to and from it, so that the protective function theory, which was previously generally accepted, has to be modified.

[1] Read at a meeting of the New South Wales Branch of the British Medical Association on April 27, 1933.

Kahler shares the view of Aschoff, that the reticulo-endothelial apparatus containing the germ centres, of which the tonsil is a part, reacts against invading toxins as well as produces lymphocytes. Waldaffels's experiments support this. He infected rabbits with virulent bacteria and found that the germ centres of their progeny were developed in half the normal time.

The tonsils, then, help to keep the body ready to fight toxins during childhood, but as they are a very small part of the lympho-epithelial group, their presence must not be overvalued.

Granting that the tonsils react against toxin invasion, it would be quite conceivable to imagine they produce antibodies; various observers consider they do, but the experimental evidence is so far not complete.

Sabatari says that after food absorption changes are demonstrable in the tonsils, along with the rest of the reticulo-endothelial apparatus, and that they show increase or decrease of the migration of lymphocytes; he contends that they have a digestive function.

Voss and Slobotnik, experimenting on animal feeding and tissue culture with tonsil tissue, got entirely opposite results. Voss found that it inhibited, Slobotnik that it accelerated growth. Kahler suggests that Voss's experiments may have been carried out with tissue that contained a great deal of toxin.

Fleishman attempted to prove that the tonsils are ductless glands, and found in them a reducing agent; also that, when injected, tonsil extract reduced the blood pressure. The reducing agent has been demonstrated in nearly all other tissues, and the lessening of blood pressure has been shown to be due to acetylcholin, which is also present in other organs.

It would appear likely that the tonsils may have some influence on growth by an internal secretion, since, when normal, they undergo involution at adolescence, but that is only a suggestion.

As they are only a small part of the lympho-epithelial system, we would not expect much harmful effect from their removal, and this turns out to be so by clinical experience. No case is known in which the removal of tonsils has been proved to do harm, nor, in the case of complete removal, does the lymph tissue surrounding undergo compensatory hypertrophy. Occasionally the lingual tonsil grows into the base of the tonsillar fossa, but this is usually due to infection of that tonsil itself, and successful treatment of it will cause it to retract.

Pathologically, however, the tonsils do not fall into line with the rest of Waldeyer's ring, the mucous glands do not open into the crypts, as is the case in the other portions of the ring, and consequently do not wash the crypts out; hence the common formation of plugs in the crypts. These plugs are not necessarily pathological, but they dam up the secretion and tend to act as a harbour for bacteria, and so may be considered as a predisposing cause of chronic infection.

The Justifiability of Tonsillectomy.

As there is great variation in opinions regarding function, so is there as to the indications for removal. Some observers say it is an almost unnecessary and unjustifiable operation.

Layton[2] deprecates the present tendency to remove tonsils and adenoids, saying that the lymph tissue is required by the body, and frequently the child is worse after operation than before.

Adam[3] gives the same view, saying that the vast majority of patients require the removal of adenoids only.

Kent Hughes[4] recently made the rather astonishing statement that: (i) 50% to 75% of tonsillectomies are inefficiently performed, (ii) the only settled benefit is immunity from diphtheria.

Most reasonable physicians and throat specialists all over the world have come to the conclusion that great benefit may be derived from removing tonsils, the difficulties confronting us being to decide exactly what the indications are for operation. Very few will advocate the wholesale removal of tonsils and adenoids in children as a prophylactic measure, and it is certain that a number of tonsils are removed unnecessarily. The focal infection doctrine, while being a very real thing, has, like all newly embraced theories, tended to be overdone, and recent writers are showing reactionary ideas, suggesting that the tonsil is too much looked on as the source of all evil. This is unavoidable to a certain extent, as examinations are often not nearly complete enough, the factors of time and expense coming in.

The vast majority of cases on which one has to decide are simple and frequently uncomplicated. The operation is then a complete or partial success, but at times no improvement is noted, and on further examination another septic focus may be discovered.

The ideal for every patient before undergoing tonsillectomy is a full bacterial examination of the tonsil surface and crypts, and microscopic examination of any material expressed; also elimination of other septic foci in the teeth, sinuses, and intestines.

In studying the indications and end results, the two have in most cases to be considered together, making a certain amount of repetition unavoidable.

No mention has been made of neoplastic conditions as not being relevant to the present discussion.

Examination of the Patient.

Having decided that diseased tonsils require removal, we now have to discover what a diseased tonsil is; and experiences of our own and others have laid down for us certain broad rules to follow in deciding, but rules cannot be followed too slavishly.

Miller[5] points out that the operation is performed too often, as it is fashionable with both public and practitioner, but that each case must be decided on its merits, and personal experience of previous cases is the main factor.

Before getting on to actual physical examination, the history must have a certain influence. When the history is positive, it is of great value, for example, a definite story of recurring sore throats and swelling of glands, or of several quinsies. When the history is negative, little can be gained from it, as the patient may be very indefinite and claim to have had no trouble at all, and yet the tonsils may be found badly infected.

The first examination is concerned with the size of the tonsil. This is far easier to appreciate in children than in adults, since in children the tonsils tend to be pedunculated and the anterior pillar does not come over the front of the gland, leaving the greater portion open to view. Hypertrophy is not of necessity indicative of disease, though it is strong presumptive evidence. When the tonsils are large enough actually to interfere with respiration, they should be removed, diseased or not. This obstruction of respiration is one of the operative indications, but it must be remembered that the adenoids are nearly always to blame for it, and that tonsils appear larger when examined, as any protrusion or depression of the tongue tends to stretch the muscular pillars and throw the tonsils more into the mid-line. Tonsils which actually cause obstruction can be seen when the mouth is opened and no depressor used; still better with the patient on his back.

In certain conditions which cause enlargement of the tonsils, removal is of no benefit and may do harm. Such conditions are: (i) Hyperkeratosis; this is characterized by excessive horny growth of the epithelium lining the crypts, and is a condition found in young adults; it subsides of itself in a year or two. (ii) Blood diseases, in which a general enlargement of the germ centres takes place. (iii) Deficiency diseases.

Stocker[6] reports that tonsillar hypertrophy may be entirely protective in early life, since it means increased output of lymphocytes; it may also indicate lack of proper nourishment. Badly fed children have enlarged tonsils; for example, tonsillar hypertrophy in Kentucky mountaineers' children, whose diet is poor in vitamins; operation does not improve them, but vitamin-rich diet does. Other observers have noted the same thing, and so a careful review of a child's diet is indicated before operation and, if doubtful, a vitamin-rich diet should be tried first. Bauner and Orpel, Kaiser, Sluder and Zaiosky have decided that operation on healthy tonsils does harm. Hyperplasia without inflammation is no indication.

The Committee of the Board of Education[7] found that in a series of 1,500 patients examined for rickets, the diseased children showed a slight predominance of enlarged tonsils and adenoids. The Committee decided that the deficiency was responsible for both conditions, as the enlarged tonsils tended to subside when the disease was treated.

Irwin Moore gives a list of the symptoms of tonsillar disease or enlargement: (i) vacant expression, (ii) mental impairment, (iii) mouth breathing both by day and night, (iv) thick and muffled voice, (v) snoring, (vi) nightmares and terrors, (vii) chronic cough, (viii) interference with deglutition, (ix) chest deformities, (x) impairment of digeston and nutrition, (xi) anæmia, (xii) foul breath, (xiii) deafness.

French, in a series of 666 cases, decided that all enlarged tonsils in children over the age of eight years are diseased, and that under that age 55% of them are. As far as those over eight are concerned, this may be true, but he does not say that they all require operation.

When the size is being estimated, a careful search must be made to see whether there has been any previous operation. Frequently one will find enlarged tonsils, looking as if they had never been touched, and the patient will give a definite history of previous operation or other interference. It is a well known fact that remains of tonsils are far more dangerous and more liable to sepsis than the entire gland, so all treatment which does not get rid of them completely must be bad treatment. The reason for these remains being more liable to infection is supposed to be the scarring of the tonsillar surface closing up the crypts and shutting in any septic material that may be there; the previous operation on the tonsil presupposes an infection at that time, so it is improbable that the inside of the closed crypt is sterile.

Graham Brown and Duhig[8] have shown that tonsillar remains after diathermy are not sterile, as has been stated by various advocates. They removed remnants after diathermy and were able to grow organisms from the deeper tissues.

Gross and Varvill[9] have just published a paper in which they state that a few diathermy treatments will make the diseased tonsil healthy and relieve symptoms. In 93 cases they claim 66 cures with an average of 5·7 applications, and admit large remains, but they take cultures from the surface only and give no idea of how long their patients have been free of symptoms.

In this paper tonsils and remains are spoken of as one unless particularly specified.

All further examinations are directed to the end of deciding whether the tonsil is infected or not, whether it is red on the surface, indicating inflamed crypts, and whether there is any obvious secretion. The presence of plugs in the crypts is of small significance, as a number of non-pathological tonsils have them. The presence of acute inflammation is a definite contraindication for operation unless there is a very strong reason elsewhere, such as acute nephritis, when the toxin appears to be getting the upper hand; it increases the tendency to hæmorrhage both during and after the operation, and also of subsequent acute infection of the raw area and possibly of the blood.

Wallace[10] advocates the removal of the tonsil when quinsy is present. He has done this in 120 cases and has had no bad results. When the patient

is not showing very marked toxic symptoms he removes the other tonsil as well. He operates on the fourth or fifth day after onset, sometimes before pus has been formed. During the time covered by these cases he claims to have seen four patients die as a result of quinsy when their tonsils were not removed.

An important point diagnostic of toxic absorption is the presence of a hyperæmic band on the anterior pillar. Graham Brown[11] calls attention to this, saying that the injection band on the anterior pillar is a definite indication of toxic absorption. This must be observed as soon as the throat is looked at, as gagging or pressure tends to obscure it by causing hyperæmia of the rest of the tissues. He says that in a general sense all adult tonsils are infected, but that does not mean they should all be removed.

Lott[12] recognizes two separate types of hyperæmic band: (i) a narrow, well defined and dark band found associated with hæmolytic streptococcus and usually metastatic in character; (ii) a broad and pale band with ill-defined edges, usually due to a non-virulent organism with local effects only.

The next step in examination is to palpate the tonsil with the finger, gloved for preference. The tonsil, even in the adult, should be mobile, and will be if it has never been diseased. Any fixation by itself does not definitely prove active infection, as it may be due to old scarring, especially after a quinsy; but it is a good indication if a septic focus is being sought, and there can be found no other evidence either in the tonsil or elsewhere. The chances are that the tonsil has retained septic matter, as the fixation interferes with the efficient squeezing action of the muscular pillars in swallowing, as they tend to close over the front of the fixed tonsil rather than extrude it.

The next procedure is to squeeze out the tonsils, and unless actual pus is found there is little significance to be attached. In this case the patient will almost invariably complain of a foul taste in the mouth, especially in the early morning. If infected teeth and sinuses can be excluded, then the tonsils will be solely responsible. Frequently a hard or semi-hard plug is squeezed out from a crypt, or a watery exudate is found, neither of which, on culture, will yield any very virulent organism. The clear exudate is probably derived from the rupture of the lining membrane of the crypts when the tonsil is forcibly extruded, and consists of lymph.

Some further remarks of Otto Kahler[1] can be summarized here. After observing that hypertrophy of the tonsil is not necessarily an indication of disease, he says that a better one is to be had from the contents of the crypts. These consist of detritus, lymphocytes, leucocytes, enfoliated epithelium and bacteria. Fein compares them to the accumulation under the finger nails. They are frequently innocuous, the hard or semi-hard plugs being especially so. The fluid exudates are the important ones, and not all these are pathological. Microscopic examination of this fluid is an important means of deciding whether the tonsils are diseased and may have caused a general illness. Kahler examined a large number of crypt contents and found that the presence of leucocytes was marked in patients suffering from diseases caused by the tonsils, such as articular rheumatism, endocarditis, nephritis, and so on, as well as those suffering from relapsing angina. Frequently pure leucocytic pus was found. In 80% of his cases leucocytes were in abundance; in 20% they were scarce. In a series of control patients who had no history of sore throats and who were not suspected of a septic focus, the percentages were exactly reversed.

Even this does not make a certain diagnosis of tonsillar infection, particularly if the illness be general, because a local crypt abscess may cause a purely local inflammation; moreover, clinical observation will miss the deep-seated inflammatory process. If there are frequent relapsing anginal attacks or peritonsillar abscesses, if there are general diseases that may be caused by a focal infection and for which no other focus can be found, then the tonsils must be removed, the more so as the operation can do no harm. In spite of all attempts to prove to the contrary, this fact has been confirmed by clinical experience. It is an error to think that patients whose tonsils have been removed, suffer more frequently from colds or infections. These illnesses cannot be prevented entirely, since they are diseases of the mucous membrane, but the apparently greater frequency in some patients can be explained by the fact that after operation these infections are more noticeable, since previously the tonsillitis claimed most of their attention.

Kahler is definitely against indiscriminate tonsillectomy, but if the indications, carefully gone into, implicate the tonsils, then there is only one remedy, removal, and no other treatment will suffice.

Organisms Infecting the Tonsils.

Next we come to the organisms infecting the tonsils.

Hæmolytic Streptococci.

Cathcart[13] finds that swabbings from patients whose tonsils have been proved to be diseased invariably show a profuse growth of the long chained hæmolytic streptococcus. This organism is now accepted as the cause of nearly all the metastatic diseases for which the tonsil can be held responsible; in fact, the presence of this type, particularly in children, is becoming an indication for operation.

As to the effect of the operation on the presence of the organism, Nichols and Bryan[14] stated that, as a result of their investigations, tonsillectomy freed the throat from *Streptococcus hæmolyticus* in nearly all cases, but they did not give exact figures to support their conclusions.

Blanton, Burhans and Hunter[15] found *Streptococcus hæmolyticus* in the throats of 44% of normal individuals, in 78% of persons with upper respira-

tory infections, and in the crypts of 80% of tonsils examined after operative removal; only very few people with complete tonsillectomy were so infected. Quoting from their paper:

> In some cases we were surprised to find hæmolytic streptococcus in throats from which tonsils were said to have been removed. These patients were examined by a throat specialist, and in every instance some remaining tonsillar tissue was found.

Tongs[16] found hæmolytic streptococcus in 65 of 100 individuals, including many school children, with enlarged tonsils, while in a series of 342 persons after operation, only 17, or 5%, were positive; in 5 of the 17 remains were present.

Pilot and Davis[17] examined 506 pairs of excised tonsils for a particular type of hæmolytic streptococcus with somewhat mucoid colonies—they called it *Streptococcus epidemicus*—and found it in 70, or 13·8% of the tonsils; 10 only of these 70 were examined after operation, and repeated cultures from throat swabs were negative, and they state that operation definitely clears this type of organism, but that it does not prevent reinfection, as persons whose tonsils have been removed may get acute infections due to the streptococcus, which disappears rapidly during convalescence.

Logan[18] carried out further experiments in this connexion, being asked to investigate the incidence of puerperal sepsis in connexion with carriers of hæmolytic streptococcus. He was unable to support the previous findings. Swabbings were taken from 19 nurses who had been submitted to complete tonsillectomy, and from 19 controls, cultures were made and 7, or 36·8%, of the control group were positive and 5, or 26·3%, of those operated on. This applies to the hæmolytic streptococcus as isolated by McLeod's test; in the case of the pseudo-hæmolytic organism, those which did not pass that test, but hæmolysed blood agar, the figures were 14, or 73·6%, of controls, 9, or 47·4%, in those operated on. Logan holds that his results may indicate that nurses are more liable to reinfection than are members of the public. Even his results, though not being so good as those of the other observers, do show a slight falling off of the presence of the organism, and it is possible that these infections, as in the *Streptococcus epidemicus*, were only temporary in the group of those submitted to tonsillectomy. No further swabbings were taken.

The Klebs-Löffler Bacillus.

Besides the hæmolytic streptococcus, specialized organisms may be found. The Klebs-Löffler bacillus is the most important, and considerable work has been done on this subject, as the enlargement of the tonsils in diphtheria epidemics called attention to them as the focus of infection. It is now accepted that if the throat of a person convalescent from diphtheria still shows positive infection after recovery from the disease, the tonsils should be removed.

Graham Brown[19] gives figures that speak for themselves. Fifty positive cases were observed from October, 1918, to March, 1919; of these 33 admitted with diphtheria failed to clear up, and 17 were carriers of up to eighteen months' standing; all were operated on and all became normal, the average time being 11·5 days. During 1919 over 100 more were treated, and all were normal in ten days. In 600 consecutive cases of diphtheria he found not one patient who had undergone complete tonsillectomy.

At the Children's Hospital in seven years he reports as follows. There were 4,164 patients; of these, ten had had their throats operated on at an earlier date, and of these ten, five had remains, three were admitted within a few days of operation. Two only had had complete removal, and the diagnosis was not proved by a positive swab.

Commenting on the work done on the power of immunizing children by tonsillectomy, he considers that it is far more important to remove the focus of infection and the breeding ground.

At the Royal North Shore Hospital, out of 333 consecutive patients, 65 had to be operated on because of persistent positive swabs, and these all cleared up in a short time.

Schick and Topper,[20] working on the subject of diphtheria immunity and tonsillectomy, found that of 151 patients, all reacting to the Schick test before operation, 124 failed to yield a reaction in six months. They consider that this immunity is possibly due to a very mild attack after operation, as they took their cases from the very densely populated districts of New York, where the disease is very prevalent.

Burton and Balmain[21] give this theory more ground since, at Ilford, where there are 246 diphtheria cases annually, they investigated over a period of years 682 cases; 527 of these were Schick positive, and of these, 27·3% had been operated on and 29·6% of them had not. Geddie[22] substantiates this. In Rochester, a small community of 20,000 people, where there have been only 30 diphtheria cases in five years, he investigated 883 patients, aged one to eighteen years, and found: (i) Among 411 patients who had not been immunized and who had not been operated on, 13·6% gave no reaction to the Schick test. (ii) Among 96 patients not immunized and who had been operated on six months or more before, 20·9% gave no reaction. (iii) Among 241 patients who had been immunized, but not operated on, 76·7% gave no reaction. (iv) Among 135 patients who had been immunized and operated on six months or more before, 74·8% gave no reaction.

Both these observers agree with the findings of Schick and Topper, that in congested areas the immunity is arrived at by a slight attack. Sheldon[23] carried out tests on 142 boys, 11·5 to 15·5 years old, and found that operation made no significant difference to the carrier rate for toxigenic diphtheria bacillus, but only lowered it for the non-virulent type. He found, however, that Schick-positive patients without tonsils were more easily immunized than Schick-positive patients with tonsils.

He considers tonsillectomy does not stimulate production of antitoxin, but accelerates latent immunization by the bacilli of the environment.

Streptococcus of Scarlet Fever.

Scarlet fever has been a more controversial subject, but since it has been accepted to a large extent that particular varieties of *Streptococcus hæmolyticus* are responsible for the disease, and that this organism is found in the tonsils and is cleared away by removing the tonsils, opinion is now in favour of the tonsil as the main breeding ground.

W. J. Harrison[24] first called attention to this in 1914, pointing out that scarlet fever is far commoner and more severe in patients with large tonsils. Dundas Grant[25] came to the conclusion, after consideration of 1,000 school children, that those with large tonsils and adenoids were more liable to scarlet fever than those without, and that therefore removal of tonsils and adenoids should lessen the incidence of scarlet fever and of its complications and sequelæ, acute rheumatism and chorea.

Another method of examination of the tonsil, advocated by French,[26] is called tonsilloscopy. The apparatus consists of a small lamp on a long handle, with a bend at the distal end so as to allow it to be placed behind the tonsil; the light transilluminates the tonsil, and the effect is observed through a magnifying eye glass. He claims that areas of hyperæmia can be made out as dark patches and that its diagnostic value is greater than that of any other method. I have never seen this instrument used and should be glad to know if anyone present has, and what value he places on it.

Glands of the Neck.

Our next investigation is the glands of the neck, a condition which is common in children, but rare in adults, unless the tonsil is acutely inflamed. An enlarged tonsillar gland in an adult, which persists after subsidence of the acute inflammation and which cannot be accounted for by any other focus, definitely implicates the tonsil as the seat of chronic infection. In children and young adults our first thought is tuberculous infection, which may be clinically obvious by abscess formation or breaking down of the glands, but if these manifestations are not present, it is impossible to be certain, as the tonsil itself seldom shows the disease. Webster[27] finds that primary tuberculosis of the tonsil is seldom, if ever, present clinically, but that the removal of the tonsils was by results definitely indicated in treatment. Malcolm Stockdale[28] remarks that tuberculous glands and Pott's disease have been very markedly on the decrease since operation for tonsils and adenoids became prevalent.

Dieulafoy,[29] in 1895, found that by inoculation of 96 guinea-pigs with tonsil tissue from patients who had no clinical evidence of tuberculosis, 15 gave positive results, but only five of these tonsils gave any histological evidence.

McBride and Logan Turner,[30] in 1897, found histological evidence of tuberculosis in three of a series of 100 cases. Rethe,[31] in 1900, found 6% tuberculous. Mitchell,[32] in 1915, found 6·5% of enlarged tonsils histologically tuberculous, and again later, in children twelve years and under, with tuberculous glands, he found that 37·5% showed evidence of disease. In a later series of Mitchell, of 106 cases, 100 children and 6 adults, 38% showed disease.

McCready and Crow,[33] in a large series of cases, found, of those who had tuberculous glands, 55% had histological disease of the tonsils; 50% of these were under ten years.

Paterson,[34] in a series of 161 patients, all with enlarged glands, some with proved tuberculosis, for example, sinuses or breaking down glands, mainly with disease presumed only, found that 57, or 35·15%, were histologically positive. The age grouping was: 98 patients under twelve years, 27 found positive, 71 normal. Seven of the 27 had proved tuberculous adenitis, and of these five had normal tonsils, and two only were positive, suggesting that the tubercle bacilli pass through the tonsil to the gland. However, when the adenitis was unilateral, the corresponding tonsil was the only one affected. Of these 27 patients, 20 had enlarged tonsils, 7 had not. In the other group, of those over twelve years of age, 14 had clinical tuberculous adenitis, 49 were presumed to have tuberculous disease; 30 were positive and 33 non-infected histologically; of the 14 proved cases, 9 were positive and 5 normal. This suggests that tubercle bacilli pass less easily through adult tonsils than those of children. Of the 30 positive cases, 14 had large tonsils, 16 had not, and in no case of the whole 161 was it possible to diagnose tuberculosis clinically from the tonsil alone.

Wood[35] found, as a result of autopsies of all patients who died of pulmonary tuberculosis, that practically every tonsil showed tuberculous lesions. He found also that tuberculosis could easily be produced in pigs by gently swabbing the surface of the tonsil with a culture of virulent bovine tubercle bacilli, and that the disease spread to the neighbouring glands.

Various observers have noted ulceration of the tonsil due to tuberculosis, but it is almost invariably secondary either to pulmonary disease or to ulceration of the tongue or gums. In these cases removal is contraindicated, since it will probably result in the raw area becoming a still larger tuberculous ulcer than it was before.

Adenoids.

When considering the tonsils of a child, that is, up to about fourteen years of age, the adenoids are usually considered in conjunction with the tonsils, and after the age of three they are nearly always both removed if an operation is performed at all. Some of the infections of childhood are caused by adenoids, by blocking the naso-pharynx, the two

chief ones being acute *otitis media* and acute sinusitis.

How big a part the tonsils play in either is not certain. O'Malley[36] considers that if the tonsils are very large they will press back on the Eustachian orifice and keep it closed, thus promoting infection, but that the adenoids are mainly responsible (*a*) by direct extension of sepsis up the Eustachian tube, (*b*) by blocking the orifice. The beneficial results of removing the adenoids are proof enough of these being the cause. As they are responsible for acute otitis, so it goes on to mastoid infection and its sequelæ. Graham Brown[19] writes of mastoid disease in the Children's Hospital, Brisbane, that during the war, when tonsil and adenoid operations were cut to a minimum, mastoid operations were never more numerous. During six months of 1922 there was no mastoid operated on, but 20 to 30 tonsil and adenoid operations were done twice a week.

The appointing of school clinics improved the position, as shown by figures:

1917-1918: Tonsils and adenoids, 497; tonsils alone, 10; adenoids alone, 118; mastoids, 14.
1919-1920: Tonsils and adenoids 879; tonsils alone, 3; adenoids alone, 13; mastoids, 4.

Very many observers give as an operative indication increasing deafness, or any sign of deafness at all, in a child or adult. In early cases the progress of this condition can be stopped entirely and even cured, but in cases of long standing or of hereditary type it is seldom that much is gained.

Adenoids, again, are largely responsible for sinusitis in children. When a child gets a cold, all the mucous membranes are involved, and if a large pad of adenoids is present, the drainage is inadequate and secretions may be retained. Dean[37] reports 80% of children cured of sinusitis by removal of tonsils and adenoids, but he blames the adenoids entirely.

Perkins[38] states that tonsils and adenoids are a frequent cause of bronchitis and bronchiectasis in children; this is probably true. Occasionally the result is brought about by direct infection, but is far more frequent as a secondary manifestation, the sinuses first being infected and the direct infection going on from there.

Pond[39] states that the tonsils cause sinusitis in adults, and reports 198 cases of tonsillectomy in which there was proved chronic sinusitis, made up as follows: 43 ethmoiditis, 33 maxillary sinusitis, 31 ethmo-sphenoiditis, and 1 frontal sinusitis. Among these cases he reports 5 patients cured, 51 improved, and 52 not improved; he does not report subsequent sinus treatment. Two of the patients cured by tonsillectomy had been treated for sinusitis for a long time before operation, but we are not told how.

METASTATIC DISEASES.

We now come to the group of diseases which, for want of a better term, we may call metastatic. It is not strictly correct, as some of the conditions already studied are metastatic in a sense, and in the ones to be studied local conditions must again come in. First of all comes one of the most discussed questions in the medical world, that of removing tonsils and adenoids without any really specific cause.

Graham Brown[19] maintains that in tropical countries almost indiscriminate tonsillectomy is advisable, as throat infections are much more frequent and more virulent.

Sington[40] reports a summary of 52 cases under his care for several years, and writes:

> The very striking conclusion which this summary indicates is that once convalescence is complete the health is so greatly improved that one has hardly ever to see them again and the child is not so liable to other and fresh illnesses, as one who retains this lymphatic tissue.

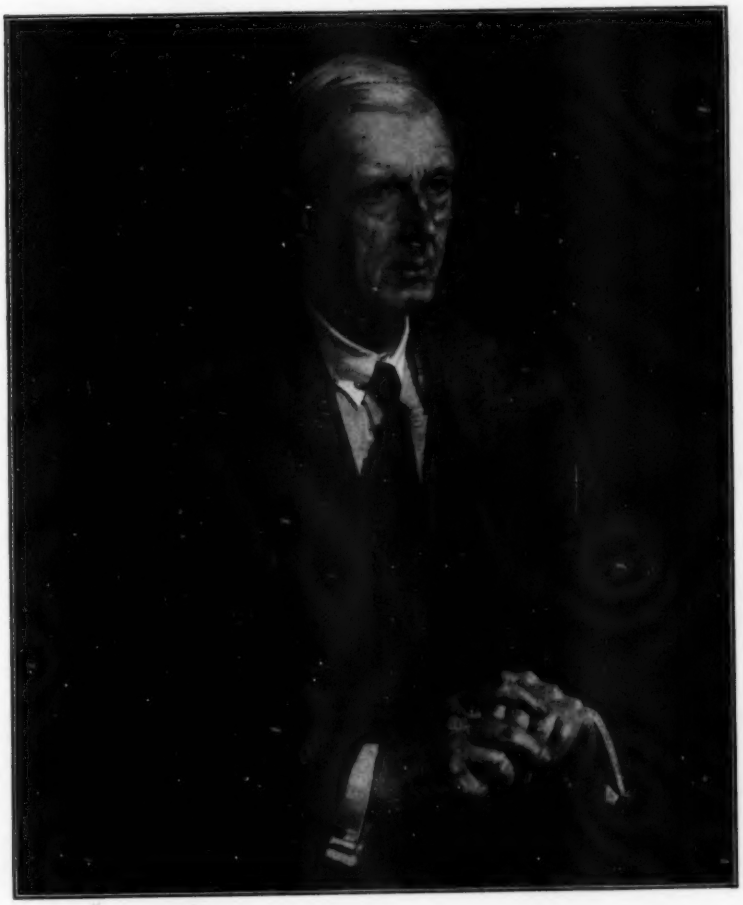
Few writers are quite as enthusiastic as these two. Miller[5] holds that indications in children are general ill health, loss of weight and of appetite and poor colour, ease of fatigue, irritability and nervousness. Operation is a success as a rule, but not always, as some patients improve and then go back. The operation is blamed, but on careful searching another focus may be found, frequently intestinal infection; but septic tonsils should be removed in these cases as well, and if tonsillectomy is followed up by vigorous intestinal treatment, all may be well.

Hamblen Thomas[41] states that children's tonsils vary, but enlarged glands mean trouble and, whatever the cause of the enlargement, the tonsils should be removed; then the glands nearly always subside.

A. D. Kaiser[42] followed up 2,200 cases of tonsillectomy in children and an equal number of controls after a period of three and ten years; he reached the following conclusions: (i) The value of operation cannot be established in a few years only; early benefits are not so apparent after ten years. (ii) Incidence of sore throats is definitely less. (iii) There is less susceptibility to scarlet fever and diphtheria. (iv) Head colds and *otitis media*, though lessened after three years, are not appreciably less after ten. (v) Cervical adenitis is decidedly less. (vi) Respiratory infections are actually more common in children whose tonsils have been removed. It has been pointed out that Kaiser's results, while very illuminating, go too far, as if immediate symptoms are relieved, surely that is all that is asked for the present.

D. Patterson and G. W. Bray[43] report 500 children who were selected for operation. Four to six years was the commonest age, and the main complaints were colds or general ill health. All gained weight promptly to a greater or less extent, and no one child was worse than before. Good convalescent homes are very important with fresh air and sunlight; therefore the operation should not be done in the winter, if avoidable.

Glover and Griffith,[44] investigating boarding school children with relation to throat infection, make the following tentative suggestions: (i)



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Epidemic tonsillitis is one of the commonest causes of invalidity and is due to hæmolytic streptococcus. (ii) This infection causes varying clinical pictures, carriers, tonsillitis, feverish catarrh, scarlet fever. (iii) Many types of *Streptococcus hæmolyticus* can cause scarlet fever, but all the manifestations mentioned above may be due to the same organism or group of organisms. (iv) All those thus infected, except the carriers, are liable to *otitis media* and acute rheumatism.

A further investigation on the same lines was carried out by Glover and Wilson,[45] investigating the results of operation for removal of tonsils and adenoids in boarding schools. They found that the operation had increased in 1930 by two and one-third times its number in 1922; that more than half the upper class children are subjected to it.

The incidence of tonsillitis is just as great among the poor as among the rich, but the operation is four times as common.

They state that diphtheria is the only disease improved by operation; ear complications are the same, sore throats are slightly lessened, but colds and lung diseases are increased. Rheumatic end results are confusing, and they state that in these cases healthy looking tonsils should be left and only diseased ones removed.

In 1,400 patients examined they found no benefit in epidemic sore throat for those submitted to tonsillectomy over those not submitted to this operation; they advise removal of very definitely diseased tonsils, but hold that the operation is much overdone, and that in 41% to 73% the operation was found incomplete. These findings called forth considerable comment. Sington pointed out that their inclusion of children with remains only confused the issue and that tonsillitis after complete removal was impossible; he said the main feature of their results was to point out the deplorable inefficiency of the operators.

Miller adds that the comparisons are made with children with normal tonsils, since, if 50% have been operated on, the others are presumably normal, so the results are as expected. All controls must be in the same condition as those operated on.

Walker agrees with the findings and states that decision as to operation should be left to the pædiatric physician and not to the ear, nose and throat surgeon.

The most outstanding of the metastatic diseases is the rheumatic group, and many and varied opinions have been expressed on it. Miller[5] believes that the antagonists of the operation expect too much. Rheumatism is a very complicated disease, and the rule is improvement after operation, and even if the disease is only very modified, operation is worth while.

Kaiser,[46] in a study of 439 rheumatic children, decides as follows: (i) The most susceptible age is eight to fourteen years. (ii) There are nearly twice as many patients with a first attack who have enlarged tonsils as there are those who have not. (iii) Recurrence is 10% less frequent in those whose tonsils have been removed. (iv) Incidence of carditis is about equal. (v) Chorea cases and rheumatism are less common. (vi) Tonsils are the avenue of infection in many cases and bear a definite relation to the disease. Removal should be advocated in rheumatic and potentially rheumatic children until more is known of the ætiology of acute rheumatism.

Leathart[47] reports 50 cases of rheumatic fever with heart lesions over a long period who were operated on. In 16 cases the temperature became normal; in 20 cases the cardiac condition stopped; in eight cases the cardiac condition improved; in six cases no opinion could be given.

O'Malley[36] finds that acute rheumatism is less common after operation for tonsils and adenoids than before, and while operation does not prevent attacks, they are less severe.

Crowe, Watkins and Rotholtz[48] recorded 31 cases of infective arthritis. Twenty-four cleared up after tonsillectomy and in four cases of myositis cure resulted. In rheumatoid arthritis they found very little good result from the operation.

Bardes[49] found good results in all cases of 200 operated on. Lillie and Lyons,[50] in 200 consecutive operations on patients with all types of myositis and arthritis, in which 56% had a history of tonsillitis, found 81% under 31 years improved and 77% over 31 years improved also.

St. Lawrence[51] found no recurrence of any rheumatic manifestations in 54 out of 85 cases; in 31 there was recurrence, and he found this to be the case in all types of rheumatic manifestation, and said that enucleation of the tonsils was the most important step in treatment and prevention.

Mollison[52] operated on 36 patients with rheumatoid arthritis. Eleven were cured and 25 improved. The earlier the case the more the patient improved; but age has little influence. In a woman of sixty-four he had one of his most satisfactory results.

Hamblen Thomas[41] found in 363 adults subjected to tonsillectomy that 21 gave a history of rheumatism; he thinks the number would be higher if the cases were carefully studied. Of the rheumatic clinic patients 3·4% were referred for throat investigation, and of these, in 6% nothing was found, in 75% diseased tonsils were found, in 18% sinusitis, and in 2% chronic septic ears. He states that remains of tonsils, as usual, are more dangerous than whole tonsils. Diathermy, cautery, and London paste all block crypt outlets. The history usually gives a longer throat infection than a rheumatic one. He finds 84% improved, 16% had no benefit after operation; none were worse. The prognosis depends on the duration of the disease.

The other viewpoint is held by various competent observers. Clarke[53] points out that there is no proof that the tonsil is the portal of entry for rheumatic fever infection. Only two things are known: (i) Diseased and unhealthy tonsils are common in rheumatic children; (ii) about one-quarter of these infections are preceded by

a sore throat. Observers vary in giving a history of from 11% to 75% of inflamed throats in rheumatic fever. Clarke states that healthy tonsils are just as common as inflamed tonsils in rheumatic fever, and inflamed tonsils are very common in childhood. Glover gives 80% of public school invalidity as due to tonsillitis, but rheumatic fever is very uncommon. There is no rheumatic fever in the tropics, but there are plenty of sore throats. Most likely there is one predisposing cause for both conditions.

Hunt and Osman[54] published statistics of 144 rheumatic infections; in 66 the tonsils were removed and recurrences took place in 53% of them. In 78 no operation was performed and 42% recurred. They advise operation only to prevent further attacks of tonsillitis.

Campbell and Warner[55] in 250 cases found a history of tonsillitis no more common in rheumatic than in non-rheumatic children, and that the tonsils looked no less healthy in the former. Of those operated on, in 124 cases where the tonsils were removed entire, 15·3% developed disease. Of 843 patients not operated on, 15·6% developed disease. Of 43 patients with remains, 32·5% developed disease.

Mary Wilson[56] studied 247 patients who were operated on, and found that operation did not prevent rheumatic heart disease; in fact, she could not find that operation had any influence at all; she states that tonsils should be left unless showing very obvious signs of disease.

There are some conditions which are hard to define by exact symptoms and which, in combination with septic tonsils, are frequently indications for operation. These have been dealt with in children already; in adults Cathcart[13] alludes to patients who are always tired, and Otto Kahler[1] refers to relapsing angina.

Besides these there are certain very definite diseases which have by experience been found to benefit by the removal of septic tonsils. Rheumatic manifestations in all their forms have already been alluded to; acute or subacute nephritis is frequently associated with septic tonsils, so in all cases of acute tonsillitis a urinary examination is advisable.

Layman[57] gathered the opinions of various colleagues and found 81% of renal conditions were cured by tonsillectomy.

Greenwood[58] followed up 43 patients with nephritis who had undergone tonsillectomy; in 31 the nephritis was acute, in 7 it was subacute, and in 5 it was chronic; 38 patients were traced and 23 were found to be normal; three had chronic nephritis. He concluded: (i) Tonsillar sepsis damages the kidneys. (ii) Operation does no damage if acute symptoms have died down. (iii) Recovery is much more likely after an acute attack than with tonsils present. (iv) Chronic nephritis probably is not benefited by operation.

Platt[59] found that in 54 cases of acute nephritis, 14 patients had septic tonsils removed with no recurrence, while recurrence took place in 16 out of the other 40. No mention is made of their tonsils. He places subacute nephritis with œdema on the same footing, but gives no figures.

Jerwood,[60] discussing septic tonsils and maternity, states that the history is a most important point in establishing focal sepsis, and leading questions are frequently required. In January and February of 1929 he examined 63 pregnant and 121 post-parturient women. Of the pregnant women 45 were unfit, 36 had septic tonsils, and 34 gave a history of rheumatic fever, scarlet fever, or tonsillitis. Of the post-parturient, 82 were unfit, 67 had septic tonsils, and 43 gave a history of the above illnesses. Seventy of these patients had albuminuria and a raised blood pressure, and 67 of the patients with renal disease had septic tonsils. He points out that unfortunately he had no controls, but that very few of this group had had complete tonsillectomy.

Toxic goître is another disease greatly benefited by tonsillectomy when the tonsils are infected. Some observers consider any enlargement of the tonsil indicative of operation. Fraser and Dunhill consider this one of the most important parts of the treatment of toxic goître.

Shurley[61] first called attention to the beneficial effects of tonsillectomy in incipient Graves's disease, saying that examination of the throat was essential in these cases.

Brown,[62] reviewing this subject, states that Graham, in 1922, found 30 cases of toxic goître improved by thyreoidectomy and tonsillectomy; this has been confirmed by others. In early cases tonsillectomy alone may be sufficient, and he believes in removing tonsils first. Attacks of acute tonsillitis in cases of toxic goître always increase the goître symptoms.

Theison and Bube support this view, but state that tonsillectomy should not be undertaken while the patient is thyreo-intoxicated.

Many other diseases are associated with the tonsils; in both children and adults digestive disturbances frequently clear up after removal of septic tonsils. Jobson[63] records two cases of duodenal ulcer, the symptoms of which had been present for two years, clearing up after tonsillectomy.

Poynton and Payne[64] showed a definite relationship between tonsillitis and appendicitis.

Asthma, particularly in children, is sometimes due to tonsils and adenoids. Miller[5] finds variable results which are impossible to foretell after operation, and thinks that this treatment should be confined to inhalation and bronchial asthma. It is probably as near true as possible to say that though the operation may fail, frequently even in suitable cases, there is no hope of cure without it.

Gafafer,[65] reporting on the common afebrile cold in adults, takes 275 patients, 138 with, 137 without tonsils. Neither group shows any material difference in frequency, severity or type of attack.

Cotton[66] calls attention to the importance of focal sepsis in mental disorders and found the teeth and tonsils to be the most constant sources of

infection. He found that he was able to double his discharges from the State Hospital, Trenton, New Jersey, and reduce the average time there of patients from ten to three months by an energetic campaign against focal sepsis; 76% of patients had infected tonsils.

Lumsden[67] records that when cultures of non-hæmolytic streptococci are taken from the interior of the tonsil and injected into rabbits, the gall-bladder walls tend to thicken. He hoped to show tonsillar infection as a factor in cholecystitis, but had not then done enough work to prove it. Since then he has made no further publication, as far as I can ascertain.

Barber[68] finds certain cases of *lupus erythematosus, alopecia areata* and urticaria improved by removing septic tonsils, and cases of iritis, keratitis, uveitis, and chorioiditis have been recorded as benefiting by this procedure.

I have been able to find two cases reported in which the actual operation of tonsillectomy is said to have been harmful. Wright[69] had a patient whose post-operative course was a definitely septic one, marked by three manifestations: (i) definite heart murmurs, (ii) blood-stained stools, (iii) gangrenous areas on both feet. The patient recovered with a residual systolic murmur and the loss of one toe. He states that the operation was the only thing to account for it.

A case is reported of a man, aged fifty-eight, who, quite vigorous before, became impotent after tonsillectomy, but here the operation cannot be directly responsible; probably it set up some dormant psychosis.

Contraindications to Tonsillectomy.

Finally, there is a list of the definite contra-indications of operation, as laid down by D. H. Jones:[70] (i) Acute inflammation of the tonsil or surrounding tissue; (ii) all cases of anæmia, Hodgkin's disease, hæmophilia, purpura, and arteriosclerosis; (iii) menstruation, menopause, early pregnancy; (iv) nephritis; (v) diabetes; (vi) *status lymphaticus*; (vii) abnormal distribution of blood vessels; (viii) acute *otitis media*.

Conclusion.

In conclusion, in spite of the fact that a large number of observers decry the operation for removal of tonsils, we see that nearly all of them hold that "the tonsils should not be removed unless obviously diseased". In other words, they admit that the tonsils can be diseased, and if diseased should be removed; and therefore the operation is justified, and in these diseased cases the results are good. The whole stumbling block is the decision of whether the tonsil is diseased or not, and it is that end, directly or indirectly, that we are attempting to reach tonight.

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Reviews.

A TEXT-BOOK OF HISTOLOGY.

It is some years since the last edition of Bailey's "Text Book of Histology", a standard American work, was published, and a new edition (the eighth), slightly overdue, has appeared.[1] Owing to the lengthy revision undertaken in certain sections of the seventh edition, parts of it were rather too full for an elementary text book. In this new edition all sections have been thoroughly revised and many completely rewritten, and this has resulted in a much more balanced presentation of the subject matter usually dealt with in a modern course of histology. There has been a pruning of the section of the nervous system, for the authors have wisely omitted the parts dealing with architectonics and have retained only those parts concerned primarily with neuro-histology. They contemplate the production of a new work on neuro-anatomy, but in the meantime, in order that the valuable material in the seventh edition will still be available, the chapters on the nervous tissue, nervous system and organs of special sense are published as a separate volume.

An entirely new chapter has been added on "The Living Cell"; it includes a description of the various methods and techniques employed in the study of living tissues, together with the latest results of investigations in this field. The study of the living cell is more and more becoming a prominent part of modern histology courses and so this chapter is a welcome addition. It has been very capably done and adequately presents all the essential details in a very clear and concise manner.

In the revision of the chapters on the organs, the authors have been assisted by their colleagues at the Columbia University, all of whom are actively engaged in histological teaching and research.

The text as a whole, in its arrangement, choice of facts, clarity and assimilability, is highly commendable and leaves little to be desired.

With regard to the illustrations, several old ones have been replaced by better, and many entirely new ones have been added. Among these new figures are some which are particularly good and beautifully reproduced, but others are very poor. For example, figure 268 on page 361: the original of this figure is a very beautiful illustration, but this copy is as bad as the original is good. Also several other copies of well known figures do not reflect much credit on the reproducer. A word also about the photomicrographs. Increasing use has been made of this type of illustration and nothing is more helpful to the student in studying his preparations than good photographs; but they must be good. When one considers the remarkable degree of perfection which has been attained in the modern equipment and materials at the disposal of the photomicrographer, one would expect to see, in a publication of this standard, better photomicrographs. Some of those reproduced are quite good, but several, such as, for example, figures 128, 326, 376, and others, are bad and should have been replaced by better ones.

On the whole, the book maintains the very high standard set by earlier editions, and will certainly continue to be one of the most popular text books.

[1] "Bailey's Text-Book of Histology", revised and rewritten by A. Elwyn, A.M., and O. S. Strong, A.M., Ph.D.; Eighth Edition; 1932. London: Baillière, Tindall and Cox. Royal 8vo., pp. 762, with 529 illustrations. Price: 31s. 6d. net.

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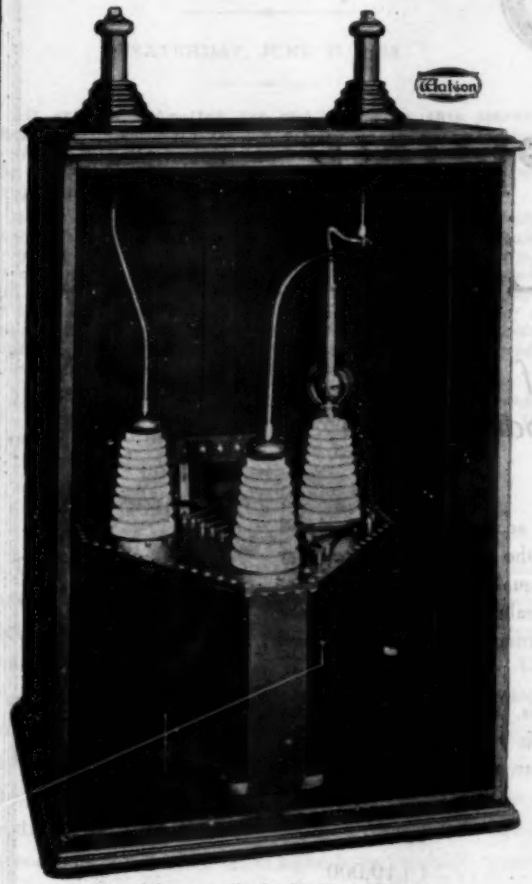

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The Medical Journal of Australia

SATURDAY, JUNE 17, 1933.

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SEROLOGICAL TESTS IN SYPHILIS.

THAT the introduction of serological tests has made the diagnosis and treatment of syphilis much simpler for the physician and more satisfactory for the patient is a statement that none will deny. It was after the well known experiments of Bordet and Gengou that Wassermann conceived the idea of applying complement fixation to the diagnosis of syphilis. Since then much work has been done, modifications of Wassermann's test have been introduced, and other tests have been devised; most of these are well known to medical practitioners. At the same time remarkably little has been added to the original work of Wassermann, and many claim that with the technique originally described by Wassermann the best results may still be obtained. The Wassermann test was originally used purely for diagnosis, but since the degree of the strength of the reactions has been noted as a result of quantitative titration, it serves as a useful guide for clinical treatment. The routine use of the Wassermann test is likely to engender the habit of accepting its results without question and of placing too much reliance on them. To awaken interest in the subject it will be useful to draw attention to a report adopted by the Health Committee of the League of Nations at its nineteenth session in October, 1932, and published in the *Quarterly Bulletin of the Health Organization* (December, 1932).

The Health Organization of the League has held three laboratory conferences for the study of the sero-diagnosis of syphilis. They were held in 1923 and 1928 at Copenhagen, and in 1930 at Montevideo. At each of these conferences large numbers of specimens of serum from cases which had been carefully studied from the clinical standpoint were tested simultaneously by a number of workers using different methods. The tests were carried out either by the authors of the methods or by workers thoroughly familiar with the authors' technique. In this way thirty-three serological methods for the diagnosis of syphilis were tried. These included twenty different modifications for the Bordet-Wassermann test and thirteen different flocculation tests. The material comprised 2,766 samples. In no instance was the worker aware either of the origin of the blood or cerebro-spinal fluid tested by him, or of the clinical diagnosis. When the clinical diagnosis and the result of the test did not agree, the test was repeated, if necessary several times, and a thorough clinical examination was made by clinicians who were delegates to the conference. When non-specific reactions were obtained, the patient was kept under close observation, when possible, for several months after the conference, and every available means of investigation was used. Only six of the twenty Bordet-Wassermann methods gave absolutely specific results, but two others gave only 0·6% non-specific positive reactions. The two methods specially recommended are that of Sordelli and his collaborators, and the Harrison method as modified by Wyler. Emphasis is laid on the necessity for considering the difficulties associated with carrying out flocculation tests. The two which were found most satisfactory were Kahn's standard test and Müller's clotting test. A recommendation is stated to the effect that at every laboratory the methods employed should be either those found most satisfactory at these conferences or "any other method which, under conditions of testing similar to those imposed at the conferences, has proved of equal value". This wide recommendation may be interpreted as a reminder

that when methods of proved value are used, it is the man behind the method that makes for success. Of special interest is the statement that in order to afford the most reliable information to the clinician, the serologist's report should always be based on an examination carried out by at least two methods. The suggestion is made that in these circumstances one method should be a Bordet-Wassermann and the other a flocculation method. This would appear to be almost a counsel of perfection, but when all the possibilities are considered, it is a counsel worth following.

There is no need to give further details of the report or of the other recommendations. That three international conferences have been devoted entirely to this subject is sufficient to show its importance. The lesson for clinicians is that serological tests for syphilis should be carried out only by one who is skilled in such work and that even when this restriction is observed, caution must be exercised in accepting doubtful or so-called negative reactions at their face value.

Current Comment.

GASTRO-ENTERITIS IN INFANCY.

FASHIONS in medical viewpoints and methods of treatment change almost yearly. In regard to the causation of gastro-enteritis in infancy, there has been a swing of the pendulum. While it was formerly held that the disorder was one of food poisoning, it is now believed to be an infection transmitted by flies. A metabolic disturbance has also been held responsible, and in latter years the condition has been described as secondary to a focal infection usually residing in the middle ear or mastoid cells. Many French and American pædiatricians believed so firmly in the truth of the last mentioned mechanism that mastoid drainage was instituted at an early stage in all severe cases. This drastic interference was undertaken in spite of considerable and widespread criticism, yet some of the results reported seemed to justify its continuance. The majority of British observers, however, have always inclined to regard *otitis media* and mastoiditis as secondary rather than primary. Leonard Findlay has recently expressed himself quite definitely on this subject.[1] He states that the conception of an otitic origin is by no means new, and that it has constantly received the support of the morbid anatomists, who have consistently failed to find any naked eye or microscopic lesion in the alimentary tract of children dying of gastro-enteritis. The commonest *post mortem* findings are a terminal bronchopneumonia, pus in one or both middle ears, and sometimes a suppurative pyelo-nephritis. Further, vomiting and diarrhœa are, in infancy, common associations with any form of toxæmia or focal infection, and to this rule *otitis media* is no exception. The alimentary disturbance is usually held to be a secondary phenomenon and rarely advances to the stage of coma, dehydration, and the Hippocratic facies so characteristic of the severer malady. Findlay draws attention to the disproportion existing in the social and seasonal incidence between this severe form of gastro-enteritis and *otitis media*, and the almost exclusive occurrence of the former in the bottle-fed child. *Otitis media* is more prevalent during the colder months of the year. Findlay states that he was unimpressed by the results of myringotomy, when applied as a routine to alternate patients suffering from severe gastro-enteritis. He admits that this operation could not be expected to relieve inflammation in the mastoid antrum or cells, but he points out that in his experience *otitis media* in children by no means always indicates the presence of pus in the mastoid antrum. Further than this, seven out of nine children submitted by him to double antrotomy died, and the two who recovered were not suffering from gastro-enteritis in a severe form.

Further confirmation of these views is now available from Canada, where M. M. Johnston, A. Brown, F. F. Tisdall, and D. T. Fraser have considered the gastro-intestinal infections of infancy.[1] A year's survey was made, covering 172 children suffering from the graver form of this disorder, coincidently with that of 107 controls said to have had "secondary diarrhœa and vomiting". Only two of the first group were private patients. The youngest was aged one month, the oldest twenty months; 79% were entirely bottle fed. Only seven infants were entirely breast fed. Death occurred in 77 of the 172 patients. On admission to hospital 64% had definite *otitis media*, as compared with 63% of the control series. Cultures were obtained in all instances from the external auditory meatus (when myringotomy was called for), the naso-pharynx, throat, and stools, and examinations were made for the hæmolytic streptococcus and other pathogenic bacteria. Only 19 positive cultures for streptococci were obtained from the ear. From the stools, microorganisms of recognized pathogenicity were isolated in 27 instances, and species of possible significance on 43 occasions. From the 107 stool examinations among the controls only one pathogenic bacterium was isolated. Serum agglutination reactions yielded further evidence of infection in the purely gastro-enteritic group than did cultures from the stool, whereas only two sera in the control series gave agglutinins to known pathogenic bacteria. In regard to the relationship of *otitis media* to gastro-enteritis, the authors conclude that 36% of the total patients showed no

[1] *Archives of Diseases in Childhood*, December, 1932.

[1] *American Journal of Diseases of Children*, January, 1933.

evidence of involvement of the middle ear or the mastoid. The control group, which showed the higher incidence of *otitis media*, did not manifest the symptoms of acute intestinal intoxication. Further, the bacteriological evidence offers no support to the masked mastoiditis theory, since only 6 of 31 cultures from the discharging ear grew *Streptococcus hæmolyticus*. Of patients coming to autopsy 42% showed no evidence of any involvement of the mastoid cells. The finding of pathogenic organisms of the typho-colon-paratyphoid-dysentery group, and associated serological reactions, in a total of 52% of infants in the group suffering from acute gastro-enteritis is to be contrasted with the discovery in only one of the controls. This, therefore, brings the subject to the now generally accepted, but by no means original, view that the clinical symptoms of acute gastro-enteritis are after all directly due to a gastro-enteric infection. This has been the general presumption in Australia, and it seems that if sufficient care is taken and adequate examinations are made, pathogenic organisms of the typho-colon group can be isolated and their immunity reactions demonstrated in the serum.

Two practical points emerge from this discussion. In the first place, though gastro-enteritis in its acute form is due to intestinal bacterial infection, the association of otitic involvement with gastro-intestinal symptoms must not be forgotten in treatment. The second point is that stress must be laid on the prevention of acute gastro-enteritis. Prevention is relatively simple and cure may be difficult, if not impossible.

ANÆMIA IN PREGNANCY.

THAT anæmia of moderate grade is not uncommon during the period of gestation has been long known. The treatment of such a condition has been, of course, part of the pre-natal care bestowed upon expectant mothers. But every practising obstetrician knows that pre-natal care is not even yet so universal or even so popular with the laity as it might be, and that conditions in the past were even more lax.

Maurice B. Strauss and William B. Castle have been carrying out an investigation in the Harvard Medical School on the anæmic states associated with pregnancy.[1] In the course of this work they obtained evidence that a true reduction in the total hæmoglobin of the maternal body occurs only in association with some dietary deficiency or anomaly of digestive secretory function. These factors being absent, anæmia did not occur.

In the present instance they have closely observed thirty-six patients suffering from an anæmia of pregnancy sufficiently severe to reduce the hæmoglobin to less than 45% or the red blood cells to less than 2,500,000 per cubic millimetre. All these patients were obviously pallid and were readily fatigued, and those more severely affected manifested dyspnœa and œdema. There were two varieties of anæmia recognized, the macrocytic ("pernicious" type), of which six cases were noted, and the hypochromic, which made up the remainder of the thirty-six. Four cases only of the whole series occurred in *primiparæ*. Examination of the gastric secretion revealed the interesting fact that only three patients had a normal acidity, all the others had a hypochlorhydria, and half of the total number had complete achlorhydria. Curiously enough, one of the patients with normal acid was a sufferer from the macrocytic type of blood change. The results of the test meals may be regarded as trustworthy, for the alcohol test meal was used and checked where necessary by a repetition after injection of histamine.

Turning to the question of diet, we note that over two-thirds of these patients had unsatisfactory diets during pregnancy and frequently prior to it. But lest a false conclusion be arrived at, it must be pointed out that half the patients with achlorhydria had adequate diets. The diets classed as "poor" were deficient in iron and in protein, and the defect was qualitative, for carbohydrate, fat and total calories were up to normal standard. Strauss and Castle give the following as a sample "poor" diet: toast, butter, coffee, milk and sugar for breakfast; bread, butter, potato or rice, pastry or cake, tea, milk and sugar for dinner; and cereal, milk, bread and butter for supper; fruit, meat and vegetables were eaten only once or twice weekly.

As regards treatment, Strauss and Castle found that large doses of iron completely relieved the hypochromic variety of anæmia, but that liver extract (perhaps with some iron) was necessary for those with the macrocytic variety. They think the dietary deficiency or a gastric secretory anomaly, or both, will explain the common hypochromic type and the lack of the specific intrinsic factor in blood formation the macrocytic type. (This specific factor is found to return after the puerperium.)

It must be remembered that the fœtal demand for blood-forming materials is one of the most important actual determining factors in producing the anæmia, and very interesting is the finding that in every case the infant at birth had a normal blood, no matter how anæmic the mother had been.

In reviewing the facts elicited by this research, it is hard to decide the part played by diet and gastric secretion. It might be argued that the anomalies of the latter may be concomitant effects and not causes of the anæmia, but whatever one may think of dietary deficiency as a cause, there can be no question of the urgent need for an adequate supply of food during pregnancy. True, the infant does not appear to suffer, but his troubles begin when his mother begins to nurse him. Therefore it is vitally important that anæmia in an expectant mother should be regarded seriously. It is not a physiological commonplace, it is not inevitable, nor is there any objection (as once was thought) to the administration of adequate doses of hæmatinics during the gestation period.

[1] *The American Journal of the Medical Sciences*, April, 1933.

Abstracts from Current Medical Literature.

DERMATOLOGY.

Dwelling Allergens as a Cause of Chronic Dermatoses and Mycoses.

E. URBACH (*Münchener Medizinische Wochenschrift*, February 10, 1933) points out that chronic dermatoses of the nature of *prurigo vulgaris* and *lichen planus*, and some cases of chronic eczema and neurodermatitis often improve by sea voyages and change of air without treatment, and recur when the patient returns home. He has carefully investigated twelve cases and divides allergens into two groups: (i) day dwelling allergens: dusts, protein of horses *et cetera*; (ii) night dwelling allergens: mattresses filled with different contents (straw, horsehair, seaweed *et cetera*). Skin tests must be carried out aganist all of these, for often the sensitivity is mixed. It was often found that sleeping in a certain room or in a certain bed or working in a kitchen produced a recurrence of the skin condition. If no cause was discovered, a change of room or house would relieve the symptoms. Whether these skin lesions are due to moulds has not yet been definitely proved, and whether such patients can be desensitized by means of the dust of the room is being investigated. When the allergen is discovered, then by removal or avoiding the allergen a cure can eventually be obtained by desensitization. If, in spite of this, the lesion occurs when the patient is in a certain room, the room must be changed.

Gangrenous Ulcer of the Abdominal Wall.

W. W. DUEMLING AND R. W. ELATON (*Archives of Dermatology and Syphilology*, April, 1933) report a case of gangrenous ulcer of the abdominal wall. The patient was a man, aged forty-two years, who was operated on for ruptured gastric ulcer. Ulceration appeared round the abdominal wound on the thirteenth day after operation. The authors think that the causative organisms were streptococci and staphylococci in symbiotic relationship. Oxyquinoline sulphate and scarlet red impregnated gauze were used as an epithelial stimulant and for the relief of pain attendant on changing the dressings. On the thirty-sixth day after operation a bacteriophage dressing was applied. It was found to be useful in dealing with recurrences of the ulceration, and was regarded as possibly having controlled the original process.

Mycosis Fungoides.

O. S. ORMSBY AND C. W. FINNERUD (*Archives of Dermatology and Syphilology*, April, 1933) report a case of *mycosis fungoides* in which the clinical picture was characteristic of the prefungoid stage of the condition. The histological picture of the cutaneous and other lesions was that usually described, and was interpreted as being inflammatory rather than neoplastic. The authors refer to the confusion found in the differentiation of *mycosis fungoides*, Hodgkin's disease and lymphosarcoma. They discuss the clinical manifestations and state that the histological observations, like the clinical manifestations, should be appraised by the predominating features. In *mycosis fungoides* a mixed cell infiltration is the predominating picture, with, in some cases, a minor number of cells of the lymphosarcoma type. In Hodgkin's disease there is also a mixed cell infiltration, but with characteristic giant cells. In lymphosarcoma the predominating picture is a uniform cellular growth with, sometimes, a minor number of the mixed cells of the other two conditions. It is possible, by recognizing the predominating picture, to classify most conditions. The authors believe that *mycosis fungoides*, Hodgkin's disease, lymphosarcoma and several other diseases united by Keim under a single title appear to be closely related genetically and could well be grouped into a class of lymphoblastic diseases. At the same time they regard *mycosis fungoides* as a disease *sui generis*.

C. G. LANE AND A. M. GREENWOOD (*ibidem*) report, with autopsy findings, a case in which *mycosis fungoides*, lymphatic leuchæmia and Kaposi's sarcoma occurred in the same person. They believe that *mycosis fungoides* should be classified as a variety of lymphoblastoma. The authors call attention to the suggested derivation of Kaposi's sarcoma from nerve sheath and vascular cells. They think that no conclusion can be drawn regarding the relationship of *mycosis fungoides* and Kaposi's sarcoma, although it is possible that there is a common exciting factor or agent.

The Patch Test in Contact Dermatitis.

S. AYRES AND N. P. ANDERSON (*Annals of Internal Medicine*, March, 1932) draw attention to the advantages of using the patch test in determining the ætiology of certain forms of dermatitis. They quote twenty-four cases in which the test was of value. The test is performed in the following way. If the substance is a chemical, it should be applied in approximately the same dilution to which the patient has been previously exposed. Leaves of plants and shrubs should be as fresh as possible. Dry powders may be moistened slightly with water. The substance to be tested is placed on a small square of cotton about the size of a postage stamp, which is then applied to the flexor surface of the forearm, or other suitable area and covered with a square of some impervious material, such as cellophane, which should be about four times as large as the test area. This external covering is then held firmly in place by wide strips of adhesive tape. The space on all sides between the edges of the central cotton square and the edges of the cellophane is sufficient to prevent the adhesive tape from coming too close to the test area. Otherwise the mild temporary irritation which usually results from the adhesive tape might interfere with an accurate interpretation of the reaction. The patch tested is allowed to remain undisturbed for twenty-four hours, unless discomfort from irritation justifies removal before this time. A positive reaction is characterized by a sharply defined square of redness corresponding in size and shape to the central test area. Papules and vesicles are also usually present, corresponding to the appearance of the original eruption. Evidence of the reaction can usually be noted for three or four days or longer after the test is applied. In rare instances the reaction may not develop for forty-eight hours after the test is applied.

UROLOGY.

Urine Reaction During Intravenous Urography.

DIETRICH SCHNEIDER (*Zeitschrift für Urologie*, September, 1932) discusses the state of the reaction of the urine during excretion of "Uroselectan" and "Abrodil". The tendency during excretion of these contrast substances is for the urine reaction to move towards the acid side. This is apparently due to dilution of the contrast substance in the blood, with consequent dissociation. The alteration of the reaction is very limited in range when the renal efficiency is low, there being only a slow excretion in such cases. No influence on the excretion of contrast substances has been observed after alteration of the urine reaction.

Rupture of the Bladder.

J. J. CRANE AND G. F. SCHENCK (*Urologic and Cutaneous Review*, September, 1932) draw attention to the increasing importance and frequency of rupture of the urinary bladder. In their five-year series of twenty-six cases, 75·1% were due to automobile accidents. It is important to establish a definite preoperative diagnosis, but drainage is so urgent that if any delay is likely to occur before diagnosis is complete, it is better to operate at once. Cystography combined with the "catheter test" is the most reliable method and is quite harmless, provided an unirritating opaque medium is used. Cystoscopy may fail on account of the size of the rent or excessive hæmorrhage. Intraperitoneal ruptures are naturally much more serious and demand the most urgent treatment. Of eleven cases, five were fatal, whereas among sixteen extraperitoneal ruptures eleven patients survived. The total

mortality was 40%, but some of the deaths are attributed to other injuries, making the total due to rupture of the bladder 28%. Early diagnosis and prompt treatment considerably improve the prospects of recovery.

Post-Prostatectomy Hæmorrhage.

EDWIN DAVIS (*Journal of Urology*, September, 1932) has studied the cases of secondary hæmorrhage in his consecutive series of 423 cases. He concludes that this emergency may be anticipated in 2·5% of cases, and this comparatively small number may pass unnoticed in a small series. The occurrence of five such cases among thirteen consecutive patients in the same hospital leads him to suggest a specific infection as the causal factor. Treatment must be prompt and vigorous. In nine cases he has used a suprapubic or perineal pack, and in one case suprapubic hæmostatic suture. Of these, two patients died. On five occasions he has used cystoscopic fulguration with complete success, and he strongly advocates this method. Under caudal anæsthesia clots are evacuated through the cystoscope by suction. Bleeding points are then visualized and fulgurated through the McCarthy panendoscope.

Cystocele.

ACCORDING to R. E. von Deusen and W. W. Looney (*Urologic and Cutaneous Review*, September, 1932) cystoceles should be divided from the surgical standpoint into two classes: those in front of and those behind the interureteric bar. The latter are quite successfully dealt with by current methods, but the former frequently recur and more often become the site of so-called recurrent cystitis. For the treatment of the latter condition the authors have devised a modification of Deming's operation of transplantation of the gracilis muscle which is giving promising results in a few cases. The advisability of using cystoscopic examination for cases in which vesical disability persists more than a month after parturition is stressed. If a cystocele of the anterior type is diagnosed, relief and sometimes cure may be obtained by the use of adrenaline without resorting to operation.

Testicular Cancer.

RADICAL operation for cure of malignant disease of the testicle is advocated by McClure, Sanguinetti and Carlton (*British Journal of Urology*, September, 1932). Complete histories and pathological investigation of two cases treated by the authors are given with details of the operative technique. Any secondary manifestation visible to the naked eye is an indication to abandon the radical procedure. The first patient, with a twelve weeks' history, survived six months. He suffered from a teratoma undergoing carcinomatous degeneration, and also a seminoma in the same testis. One small area of microscopic metastasis was found in this case. The second operation was undertaken in two stages after microscopic diagnosis had been established. The history was of only six weeks' duration, no metastases were found, and the patient survives without symptoms twenty-one months after operation.

Fever in Renal Tumour.

L. JUNGGREN (*British Journal of Urology*, September, 1932) describes a case of renal tumour in which fever was the leading symptom. After numerous special examinations it was found that the patient's sedimentation rate was high, and in six months he lost nine kilograms in weight. The diagnosis was established by pyelography. In the absence of infection, the author suggests that the fever may be due to absorption of the toxic products of necrosis in the tumour.

Vesical Bilharziasis.

N. MAKAR (*British Journal of Urology*, September, 1932) gives an account of bilharzial lesions as seen through the cystoscope. There are numerous illustrations in colour of the various lesions described in the text. A brief description of the pathology is given and the author pleads for cystoscopic control of such cases, especially when they fail to respond to or recur after antibilharzial treatment. The liability to complications, especially carcinoma, is emphasized.

The Urinary Tract in Lesions of the Spinal Cord.

As a result of a careful study of structural and functional changes in the urinary tract following lesions of the spinal cord, R. E. Cumming (*The Journal of the American Medical Association*, December 10, 1932) comes to the following conclusions: (i) Emptying of the bladder can be established after retention due to a cord lesion without catheterization. Caudal anæsthesia facilitates emptying in resistant cases. (ii) Ascending renal infection invariably follows infection of the bladder. This is the commonest cause of death amongst those who survive early effects of a cord lesion. (iii) Rarely there is spontaneous recovery from renal infections, but recurrences are frequent. (iv) With an established urinary tract infection in the presence of a paralysed bladder, infection may be cured or greatly ameliorated by accepted types of treatment, for example, by ureteric catheter drainage. (v) In the absence of gross infection, hydronephrosis and ureteric atony are uncommon with the paralysed bladder.

Acute Ureteral Obstruction.

ACUTE ureteral obstruction is the subject of discussion by N. F. OCKERBLAD (*Journal of Urology*, January, 1933). After a description of the symptoms and signs, the author points out that, excluding calculi, the condition is rarely diagnosed. "If", he remarks, "it were not for the fact that in most persons there are two kidneys and two ureters, the disease would be as well recognized as intestinal obstruction". Excluding those due to calculi, he has records of twenty-seven cases collected in sixteen years. Of these, only one can be attributed to a classical Dietl's crisis. Other causes discovered are seminal vesiculitis, pregnancy, congenital stricture, tuberculous stricture, ligature at operation, appendiceal abscess, operation scars and carcinoma occluding the intramural ureter. It is emphasized that treatment is urgent if the kidney is to be retained undamaged, as it has been shown that eight hours of complete acute obstruction are sufficient to produce gross renal damage. Immediate treatment consists in drainage by ureteral catheter.

Hernia into the Female Bladder.

F. J. CUSHMAN (*Journal of Urology*, January, 1933) states that this condition has not been recorded previously. His patient had, six years before, undergone hysterectomy for fibroids. She came under observation for persistent hæmaturia. A globular tumour, about 5·5 centimetres in diameter, was seen at the left horn of the trigone with the left ureteric orifice opening on its surface and emitting clear urine. A small umbilicated area above the left ureteric orifice caused a provisional diagnosis of ureterocele of a duplicated left ureter with atresia of its orifice to be made. Pressure with a bougie caused dimpling of the mass and full distension of the bladder caused the mass to disappear, leaving a crater resembling a diverticulum. It was proposed to open the ureterocele by diathermy, but at a subsequent cystoscopy peristaltic waves were seen, and these established the diagnosis of hernia into the bladder. No treatment was required.

Renal Sympathectomy.

W. P. HERBST (*The Journal of the American Medical Association*, December 10, 1932) has studied the effects of renal sympathectomy by preoperative and post-operative pyeloscopy. Four problems have attracted his attention. First, he asks whether there is any change in the mobility of the pelvis and ureter after sympathectomy. His evidence shows that "some adynamic-appearing pelves appear more toxic and active . . . some spastic dynamic-appearing pelves appear more flaccid and relaxed". Secondly, if mobility changes do occur, he asks whether there is any interference with satisfactory drainage. His reply is definitely in the negative. Thirdly, he is unable to answer the question as to how long mobility changes persist. He has at least one case which suggests commencing return to its earlier type of mobility after eight months. Finally, he is unable to offer any conclusive evidence as to whether the relief of pain achieved by the operation is due to section of pain-conducting fibres only, or whether it is due to altered mobility of the pelvis.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held on April 13, 1933, in the Robert H. Todd Assembly Hall, British Medical Association House, 135, Macquarie Street, Sydney, DR. A. W. HOLMES À COURT, the President, in the chair.

Tonsillectomy.

DR. R. H. BETTINGTON read a paper entitled: "The Indications for and End-Results of Tonsillectomy" (see page 734).

DR. LAURENCE HUGHES prefaced his remarks with an expression of regret that it had not been possible to carry out the original arrangement of having two papers, one from the Section of Pædiatrics and one from the Ear, Nose and Throat Section. He felt that the opinion of the pædiatrician would have been valuable. Dr. Hughes expressed gratitude to Dr. Bettington for his paper. Tonsillectomy was still an operation that was largely performed; nevertheless the evidence deduced from the end-results had somewhat modified its value.

Dr. Hughes wished first to consider the subject in regard to children. The function of the tonsils was not yet ascertained, but they probably conferred a certain degree of immunity. On the other hand, they might be the portal of entry of infection and, as such, a menace to the child's health. There was little doubt that children who presented the symptoms of mouth breathing, defective hearing, repeated sore throats, colds and discharging ears, benefited by tonsillectomy; and in most of these conditions there was accompanying malnutrition, which improved after operation.

In regard to chronic infections of the lung in which infections of the upper respiratory tract played a part, tonsillectomy was liable to be disappointing. In such conditions the coexistence of sinusitis should be kept in mind.

Turning to the incidence of infectious disease. As far as diphtheria was concerned, tonsillectomy did provide a certain amount of immunity. At the Children's Hospital faucial diphtheria was rarely found in children whose tonsils and adenoids had been removed. There was a difference of opinion in regard to the influence of the tonsils in scarlet fever. Bradford's work in America showed that tonsillectomy did not produce any appreciable degree of immunity in regard to the incidence, severity or subsequent complications of the disease.

The association of tonsillitis with rheumatic infection was well known. And in view of the fact that other illnesses associated with tonsillitis frequently improved after the tonsils were removed, the same might well apply to rheumatism. Nevertheless, the question at times demanded the finest judgement.

Streptococcal tonsils were frequently associated with acute hæmorrhagic nephritis in a child, and tonsillectomy was definitely indicated in such cases.

In regard to the bacteriological examination of tonsils before deciding on tonsillectomy, Dr. Hughes thought that the work of Sawers and Barrett was most instructive. But as the pus was often very deep-seated in the tonsil, it might sometimes be difficult during life to obtain a tonsillar discharge.

Turning to the question of tonsillectomy in adults, Dr. Hughes said that since focal sepsis had been established as an ætiological factor in association with systemic disease, attention had frequently been focused on the tonsils as the probable source of infection, and in many cases they had been ruthlessly removed without justification. In conditions such as chronic arthritis, duodenal ulcer, thyreotoxicosis, the tonsils should be investigated with other sources of infection, and if they were found to be the offending members, then they should be removed.

In reference to arthritis, if infected tonsils were discovered early in the course of the disease, good results frequently followed their removal, but in the later stages the results of tonsillectomy were likely to be disappointing.

In conclusion, Dr. Hughes referred to tonsillectomy and the general practitioner. The statement was often made that tonsils were too frequently and unnecessarily removed by general practitioners. Dr. Hughes always held that if the practitioner was satisfied in his own mind that the operation was necessary, and if he was confident that he could carry it out, then it was right that he should do it. But to treat the operation as trivial and to operate without sufficient knowledge was bad surgery and bad practice. The general practitioner was in a favourable position for the assessing of indications for and the after-effects of tonsillectomy. He saw the patient year in, year out, and should be able better than the consultant to assess whether operation was necessary. After operation the general practitioner was in a position to follow up the child's after-life and was often impressed with the improvement of the patient who had been subjected to tonsillectomy.

DR. A. J. GIBSON said that he had been interested in the question of tonsils for some considerable time. The first paper he ever wrote had been about tonsils. He greatly appreciated Dr. Bettington's paper and had gained a great deal of information from it. There were several points he would like to raise in connexion with the after-effects of hypertrophied and unhealthy tonsils. He had found that toxæmias of pregnancy might be expected when there was a history of recurring tonsillitis. Dr. Bettington's quoted results were uniform with his experience. When there was a history of recurring tonsillitis, albuminuria would be found during the later months of pregnancy. Recurring tonsillitis was caused by streptococcal organisms. Probably mild nephritis occurred, subsided, and was overlooked; but no damage was done and in the strain of the later months of pregnancy the symptoms would show themselves. In trying to decrease maternal morbidity and mortality these aspects should be widely known. If toxæmia was present, then the patient was liable to the complications of hæmorrhage and sepsis, and these three were the main causes of maternal mortality. If practitioners were on the look-out for the early signs, they might be able to diminish the maternal mortality.

Recurring tonsillar infection, especially in girls, should be dealt with by removal of tonsils. The importance of the subject was realized when it was known that unhealthy tonsils, not only in the patient, but in nurses and doctors, were prone to cause puerperal sepsis by droplet infection. Severe puerperal sepsis was usually due to streptococcal infections. Dr. Gibson spoke of the custom of taking swabs from the nose and throat of the nurse, doctor and patient, to be tested against a strain from the infected uterus. The organism present in the swab from the nurse or medical attendant had in some cases been found to be the infective organism of the patient. Also infected tonsils in nurses sometimes caused erysipelas in the newborn.

Dr. Gibson concluded his remarks with thanks to Dr. Bettington.

DR. EDGAR STEPHEN said that he thought there was very little he could add to what had already been contributed. He thought that not only the general public, but also many practitioners, held the opinion that operations on tonsils and adenoids should on no account be performed before the age of five years. He considered that it was advisable that it should be made clear that when ear trouble, croup or frequently recurring nasopharyngitis was complained of, the operation should not be postponed till that age. A very special instance where operation was required in infancy was mongolism. The subjects of this condition were habitually affected with nasal obstruction and discharge, and though considered bad operative risks under chloroform, in his opinion they proved satisfactory patients for operation under ether. In patients with acute rheumatism Dr. Stephen thought the tonsils should be removed at a suitable time. In his experience their removal had been well justified. In patients with chorea he advocated the same step, but recurrences were known to occur in a number of cases in spite of the removal of tonsils. In conclusion, Dr. Stephen congratulated Dr. Bettington on his remarkably clear and well-balanced

paper, which, he said, was a valuable contribution to the work of the Association.

DR. ROBERT GODSALL thanked Dr. Bettington and the speakers. One point had not been discussed. Many people suffered from ill-health with no ascertainable focus of infection at all. In such cases there was nothing to indicate the tonsils; there was an absence of sore throats or any symptoms referable to the tonsils. The infection was apparently absorbed into the system because of the absence of reactionary phenomena, such as sore throat. Dr. Godsall recalled the case of a girl who was in a dying state; no tonsillar infection could be discovered and the girl was in a parlous condition. There were no symptoms referable to tonsillar involvement, yet after removal of the tonsils the patient made an uninterrupted recovery.

Dr. Godsall was aware of cases of thyreotoxic goitre of adolescent girls which responded to tonsillectomy. In recurrent albuminuria or where sugar was present, cessation often resulted from the removal of tonsils.

As to removal of tonsils by the general practitioner, Dr. Godsall had no objection so long as he removed them. But he deplored the mutilated throats that resulted because the operation had been done by general practitioners who had not studied the technique. Specialists would welcome any general practitioners who wished to come and watch them operate in the hospitals. The operation was difficult to do, and the ability to do it was not a gift from the gods conferred with an M.B. certificate. No one minded the general practitioner removing tonsils if he removed them properly.

Dr. Bettington's paper was a remarkably good one, and it was hard to add to it in any way. He was to be congratulated on the amount of information that he had contrived to give in so short a paper.

DR. H. S. MARSH said that there was little left to say; he could only add some of his various experiences. He had seen good results after taking a child's tonsils out when there was apparently nothing wrong with them; yet the child had nephritis. He had even taken tonsils out when they did not appear diseased; and the condition had been cured. Other patients were cured who suffered from diabetes, and in rheumatism particularly it was necessary to take the tonsils out. Dr. Marsh himself had had rheumatic fever during his fifth year of the medical course; it had been preceded by tonsillitis. The tonsils had been taken out and he had suffered no further attacks.

In children a large number of tonsils were taken out that should not be. On the whole he thought that tonsillectomy prevented infection from measles and scarlet fever; but this was not sure. In diphtheria, however, removal of tonsils was essential.

DR. RICHARD FRANCIS expressed his thanks to Dr. Bettington for his comprehensive paper, which left very little to be said. Dr. Stephen had mentioned that in popular opinion five years was the acknowledged age at which tonsils could be removed. Going to the other extreme, the general public and some medical practitioners held the equally arbitrary opinion that there was an age limit and that patients could be too old for tonsillectomy. Enucleation of the tonsils with machine anæsthesia and suction apparatus was a safe operation and much less debilitating than many others frequently advised and successfully performed on patients of advanced years. Patients about middle age were often found in ill health, suffering from fatigue and debility *et cetera*, who had definite tonsillar infection. They stood tonsillectomy very well, and local discomfort did not seem to be so great in older people. In regard to children, hypertrophied adenoids would cause hyperplasia of the tonsils without infection. Early adenectomy would bring about reduction in the size of the tonsils, and often alone sufficed.

DR. V. KINSELLA added his praise of Dr. Bettington's paper to that of the other speakers. Mention had been made of the doubtful function of the tonsils, since it was possible to get on so well without them. A couple of calls at inconvenient hours had convinced Dr. Kinsella that the main function of the tonsil was to catch fish bones and to prevent them from getting into more inaccessible parts of the alimentary canal. They were better developed and more needed in childhood.

DR. E. H. STOKES thanked Dr. Bettington for his paper and stated that other speakers had referred to the favourable results of tonsillectomy, but he wished to bring under the notice of the meeting two cases in which the operation had had serious consequences. In the first instance he had been called to see a patient whose tonsils had been removed and whose condition was such that he had been asked whether he thought a blood transfusion was necessary. On inspecting the chart, Dr. Stokes had noticed that before operation the patient's temperature had been of a remittent type. A blood count was ordered and it was found that the total number of leucocytes was 40,000 per cubic millimetre, of which 95% were lymphocytes. This patient had died. The second patient had suffered from endocarditis, the result of rheumatic fever. The tonsils had been removed and pericarditis had developed. After a long illness the patient recovered.

DR. E. A. TIVEY, in regard to the question of age limits in the performance of tonsillectomy, said that he thought this conception was largely due to the influence of the teaching at the time when he was a student. Russell Nolan emphatically stated that no person over the age of seventeen years should be subjected to a cutting operation of the tonsils. He always cauterized them.

In regard to the investigation of the tonsils, Dr. Tivey wished to know if any use had been made of the method of F. C. Eve and his suction apparatus for the drawing off of material from the tonsil, followed by the application of antiseptic paste.

As to the removal of tonsils by the general practitioner, only that day he had seen a child whose tonsils met almost at the mid-line. The mother informed him that the tonsils had been operated on eighteen months previously by a specialist in Holland.

DR. E. P. BLASHKI wished to join in the chorus of praise. He emphasized the difficulty that he and his colleagues had in dealing with statistics of end-results of tonsillectomy. The value of the statistics was vitiated by their stating only half truths; the data were so incomplete that it was almost impossible to understand what was meant. Notoriously they knew that if wrong conclusions were wanted on a certain subject, a committee should be got to sit on it. So they were driven back to their personal experience, and he was convinced that discussion with a colleague was of more value than volumes of statistics.

From his experience of chronic nephritis, Dr. Blashki would not say that tonsillectomy did not confer any benefit in this condition. Removal of the septic focus must have some value, and in some cases the tonsil was found to be the only available focus to deal with; moreover, it should reduce exacerbations. Tonsillectomy alone would not be beneficial in infected teeth, but he did not want to deal with such cases now.

In diphtheria continued attacks ceased after removal of tonsils. Dr. Blashki had once thought that it was impossible to get scarlet fever after tonsillectomy; but he had found that it was possible.

In regard to late cases of arthritis, Dr. Blashki was convinced that the condition of some patients did improve after tonsillectomy, even though the literature said that they did not. They should not be deprived of this chance.

In conclusion, Dr. Blashki said that the general practitioner who practised tonsillectomy should learn to be ambidextrous in the use of his instruments.

Dr. Bettington, in reply, thanked the speakers for their kind and flattering remarks about his paper. In regard to the suction apparatus, mentioned by Dr. Tivey, Dr. Bettington said that he had tried to use it, but that it generally seemed to fasten on to the soft palate, and when it did fasten on to the tonsil nothing ever came out.

As to the question of mongols, Dr. Bettington suggested that the notoriously large and infected adenoids belonging to this type might infect the sinuses, especially the sphenoidal sinuses; the infection would then extend to the pituitary, causing pituitary disease.

Dr. Bettington thought that the popular conception that a child's tonsils could not be taken out until it was five years old might have arisen from the days when the guillotine was used with great leverage on the lower jaw;

in the very young child this frequently led to fracture of the bone.

DR. A. W. HOLMES À COURT said that they were indebted to Dr. Bettington for his lucid description of the subject. Unlike the controversial spirit that characterized recent discussions on the methods of removing tonsils, the tone of Dr. Bettington's paper and of the meeting as a whole showed that in considering the indications for the operation they were on relatively sure ground and were able to reach a reasonable agreement. He stressed the necessity for careful clinical investigation before deciding upon the removal of tonsils. It was instructive to hear Dr. Bettington's reasoned statements from the point of view of the specialist, and those of Dr. Hughes from the point of view of the clinician.

Obituary.

ROBERT HAMILTON RUSSELL.[1]

WE are indebted to Sir Richard Stawell for the following appreciation of the late Robert Hamilton Russell.

By the death of Mr. R. Hamilton Russell on April 30, 1933, there has passed away a man who had been for many years one of the most distinguished surgeons in Victoria, and whose name was not unknown throughout the English-speaking world of surgery. At the end of 1889 he had come to Melbourne from London, a young man, quite unknown, with no relatives here and but few acquaintances, yet, by the quiet force of his very fine character and cultured personality, and by the strength of his exceptional ability and surgical knowledge, within ten years of his arrival he was recognized by the medical profession in Melbourne as a wise and thoughtful surgeon and as a remarkably skilful, yet patient, operator.

Hamilton Russell was born at Farningham, England, in 1860. He obtained his medical education at King's College Hospital, London, and was one of the surgical dressers under the great Lister; later, when he was qualified in 1882, he was chosen by Lister to be his house surgeon. In this part of the world Lister's name will for ever be associated with the name of Hamilton Russell, for he was in spirit, both in his life and in his professional work, a true and steadfast disciple of that unsurpassable man.

At King's College Hospital Mr. Russell was also house accoucheur under Dr. W. S. Playfair, the celebrated professor of midwifery in that medical school.

After leaving King's College Hospital, Hamilton Russell, on the recommendation of Lord Lister, was appointed resident surgeon to the Shropshire County Hospital, situated in the delightful town of Shrewsbury, a position he held for some two years. He then returned to London for further study and obtained the diploma of F.R.C.S. (England) in 1889. He then came to Victoria, largely for the benefit of his health and in the hope of obtaining some professional surgical work, but no surgical opening seemed possible for him, and he commenced general practice in Hawthorn. That particular kind of work was not congenial to him, and waiting for surgical consultation work in an almost unknown city was disheartening to a man of his attainments and sensitive temperament, so that in 1891 he felt forced to apply for the position of medical superintendent of the Horsham Hospital (Victoria). But he was not given the position; for the unwise men of the world who then formed the selection committee, decided, as one of them informed Mr. Russell years later, that there must be something "crook" with a gentleman who had such high qualifications and such splendid testimonials from England and yet was applying for a position in an up-country hospital in Victoria.

However, next year, in 1892, Mr. Russell was appointed one of the honorary staff of the Children's Hospital, Melbourne. He was at once recognised by his colleagues on the staff as a delightful companion and as a man with quite exceptional surgical abilities. Private professional work, of course, came slowly, but Hamilton Russell was intensely interested in the science of the common surgical problems with which he had to deal. He had, to an uncommon degree, the scientific spirit of practical inquiry and he was original-minded. At the Children's Hospital, among other common surgical subjects, he tackled the problem of inguinal hernia, and in August, 1898, he read his first paper on this subject. In the following year there was published in *The Lancet* a notable article by him on "The Ætiology and Treatment of Inguinal Hernia in the Young". His published works on this subject brought him recognition in Melbourne and throughout the world. Whatever adverse criticism Russell's views on hernia provoked, it was clear that his work was distinguished by a special high quality of thoughtfulness; indeed, it may be said that all his surgical work throughout his life was marked by a high and thoughtful quality and by honest-mindedness.

In addition to his work at the Children's Hospital in these years, he was one of the honorary assistant demonstrators in anatomy in the Melbourne Medical School, but he always wished to have a wider scope for surgical work and clinical teaching than was open to him at the Children's Hospital, and in 1901 he applied for and was appointed to the honorary surgical staff at the Alfred Hospital, Melbourne. It was clear to all his friends that this appointment brought a special interest and a joy into his life, it was indeed a new life to him, and he held the appointment for nearly twenty years, until he reached the retiring age of sixty years.

Two years after Mr. Russell's appointment to the Alfred Hospital he was elected President of the Medical Society of Victoria, then the chief medical society in that State. His presidential address, January, 1904, dealt in a masterly way with "The Congenital Origin of Hernia", a subject that had occupied his attention for several years. It will be seen that in those days Hamilton Russell's life was full of the work and the responsibilities which interested him most; his character, his training and his abilities had come into their own.

He was in England at the time of the outbreak of the Great War and served for a time with a British hospital unit in France, but returned to his Alfred Hospital duties and to carry on his part in the Home Medical Service of those days.

In 1920 Mr. Hamilton Russell was specially reappointed by the Committee as full surgeon to the Children's Hospital for a period of five years, so that for thirty-three years, from 1892 to 1925, he exercised in his quiet but compelling way a remarkable influence for good upon students, resident surgeons and colleagues who were associated with him in any way. His very pleasant appearance, his whole manner and bearing, the tone of his voice and the phraseology he used were the characteristics of the best type of the cultured English professional man. He was rather reserved, always thoughtful, always kind and appreciative of others.

After 1925 Mr. Russell's chief service to the work and profession of surgery in Australasia was carried out in connexion with the foundation and the organization of the Royal Australasian College of Surgeons. In this work he took the deepest interest to the day of his death. The crowning moment of Hamilton Russell's life occurred at the annual meeting of the Fellows of that College on March 24, 1930, when he was presented with his portrait in recognition of all the work that he had done for surgery and for the help and guidance of his fellow surgeons. His speech, in acknowledging the gift of the portrait, was a perfect and beautiful expression of the ideals of his own life's work and of the work of surgeons, ideals which had been set before him in his youth by Lister, his master and his friend.

From the first, in the early "nineties", his papers were recognized to be models of expression of English prose, suitable to the exposition of scientific and surgical subjects. In debate he was not a very fluent speaker; he was apt to hesitate for exactly the right word, but his contributions to any debate were clear and honest, and always carried great weight.

[1] The photograph published in this issue is reproduced by permission from *The Australian and New Zealand Journal of Surgery*.

All his life he was a most delightful companion, entirely unaffected, with a quiet, delicate sense of humour, very restful, and sometimes very silent in a pleasant sort of way. Apart from his interest in surgical matters and in hospital work and the welfare of young "residents", his chief personal pleasure was in music; he had remarkable gifts as a pianist and great knowledge and appreciation of the best types of music; all this brought him great solace in the latter years of his life. In his early professional days he found it wise to cover up his musical gifts and proclivities by silence, for he had an earnest and steadfast desire to succeed and to justify his training as a surgeon and a teacher.

In later years he was grievously crippled by a condition of osteoarthritis, affecting both hip joints, so that he was very lame, but this disability he bore with remarkable courage and uncomplaint. Gradually there were also occurring those defects of vigour inseparable from advancing years, and then came his sudden death from the injuries received in a motor car accident. After the first shock of his death, his many friends must feel that this sudden, almost painless passing of Hamilton Russell must have been just what his fine, sensitive and unselfish spirit would have wished. All that Hamilton Russell stood for, and all that he showed forth in his life must and will exercise an abiding influence for good in this community and in this part of the world of scientific medicine and surgery.

Hamilton Russell's former house surgeons write:

Rich in the friendships he had drawn to him in a long life, assured that the high ideals inherited from his illustrious Lister had been safeguarded and illumined by his own work and revered by his colleagues in the medical and nursing professions, Hamilton Russell has passed into the Great Beyond.

How unique the position he had occupied and how great the affection he had inspired were abundantly evident in the congregation that assembled at Holy Trinity Church on the morning of May 3. Physician, surgeon and layman, old friends and old patients, men and women, came there to pay their last respects to his memory.

His name is famous as a great surgeon, as an original thinker, and as a designer of operative technique, and to it tribute has been paid by surgical authorities in all countries. We, his house surgeons, would write of the master and the man.

On appointment to the staff of "The Alfred", Hamilton Russell brought with him the highest ideals of devoted service and breadth of outlook, and infused new life and vigour into the surgical work of the institution, remaining an inspiration and a stimulus throughout his long association with the hospital. Free from the jealousies of lesser men, he strove successfully to foster friendly relations between his colleagues. By kindly encouragement in their work and pride in their achievement he spurred them on to further effort.

It was his custom to attend on almost every morning of the week, and very frequently on Sundays—his private practice might at times be forgotten, his hospital patients never—and on these visits he would regularly dress his cases. Each dressing was a delightful example of artistry. The purpose of each was explained, whether fomentation for the relief of an inflamed area, the maintenance of a covering for a wound, or the support of an injured limb. There followed the method of application of the component parts of the dressing, exact in the smallest detail, and finally the careful and skilful adjustment of bandage peculiarly fitted to the particular region. Such a demonstration could not fail to impress the onlooker with the great love of the man for the art which he was practising.

Every visit to the bedside was for him an opportunity to make fresh observations on the progress of the case, to increase his store of surgical knowledge, to teach a lesson to student doctor or nurse, and to add to the comfort of the patient and hasten his recovery.

There was no haste; quietly and carefully an account was obtained of the symptoms, and a well reasoned assessment of their diagnostic value was made. Then came extraordinarily accurate observation, the result of constant training and of senses that seemed to be attuned to the work in hand. His eye could see where others were blind, until attention was directed to the obvious. His keen ear could note a change in the character of respiration before his anæsthetist. His sensitive hands could feel with almost unerring certainty, hands that it was a delight to see fondling a broken limb, instinct with the knowledge of the painful responses that were lying in wait, yet never were elicited.

When all the relevant clinical facts had been gathered, these were placed in their proper perspective and such a completed picture of the case was drawn that little doubt was left as to the diagnosis.

A plan of treatment was carefully considered and the steps of the operation were discussed, and when these had been carried out, the surgical procedure was again brought under review to determine the merits or demerits of each for use in the next similar case. After operation studious observation was renewed and carried on almost daily to the termination of the case, always with the object of gleaning facts of surgical importance to add to the store of knowledge.

Such a careful, accurate and complete study of the individual case was the basis on which was founded and gradually built a surgical insight, a manipulative skill and a treasury of wisdom that placed Russell as high amongst his fellows as Lister stood amongst his contemporaries.

Placing little reliance on the value of statistics as a means of imparting knowledge, with almost a distrust in the lessons they could teach, he was strong in his conviction that the only sure way to be continually accumulating knowledge lay in the daily observation of the particular case.

We who were fortunate enough to come under his powerful influence, were not taught surgery in the conventional manner, not given merely the results of the experience of others, not encouraged to depend on books; we were trained to observe and think on surgical lines. We were not so much given surgical knowledge as shown how to acquire it.

Perhaps the finest tribute of this master was paid when former students, faced with the new difficulties and problems of military surgery in France, attempted to solve them by the simple process of asking themselves the question: "What would 'Hammy' do?"

Simplicity was one of the standards by which he judged his own work. Always the way must be easy; if the method in use proved difficult and troublesome, then it was not surgery. There was an easy way, and that way must be found. So the complicated apparatus was discarded, the cumbersome splint set aside and replaced by a posture, a bandage or a sling that would achieve the objective.

Every one connected with the management of the case was encouraged and stimulated to play his or her part to the full. They were made to feel that the ultimate object, the recovery of the patient, was to be the result of their own endeavour. Thus team work was brought into being. The simpleness and sincerity of the man enabled him to give due consideration to any suggestion that might be made by a member of the team, and at times, on the acceptance of some observation made by a junior, the course of a carefully planned operation might be entirely changed.

When Mr. Russell entered the ward one was immediately aware of the presence of a great man. The noble head of silver white hair, the finely chiselled features radiating good nature and love for his fellow man, surrounded him with an atmosphere of quiet, courtly dignity and commanded the respect and admiration, almost the reverence, of everyone present. He passed quietly from bed to bed, showing the same kindly consideration to all, and was perhaps seen at his best in his gentle dealings with little children.

His love of youth was never failing. Some of his happiest moments—and ours—were spent at the evening meal in the hospital dining room where, amongst his boys, he gave rein to wit and humour and joyous laughter. His student was always to him "my boy". Even when

grown past middle age the same kindly form of address was used towards them. He trained them, advised and encouraged them, and followed their careers with the interest of a parent, and when they were scattered to the far ends of the earth, still wrote them long and friendly letters.

Never robust in health, he bore the many afflictions that beset him with a fortitude that was a source of wonderment to his friends. Once, in search of health as a guest on an outback station in New South Wales, he had the misfortune, whilst alone, to slip on the river bank and sustain a Colles's fracture. Realizing that he was very far from medical aid, and thinking that the journey for help would be a tax upon his host, he resolutely put his arm across his knee and, enduring the pain, successfully reduced the fracture, then, returning to the house, directed the application of splints and his own treatment to recovery.

Always abounding in sympathy for the sufferings of others, he was at all times exceedingly reticent concerning his own. A crippling arthritis of one hip, followed by a similar condition in the other, and a threatening blindness of one eye were the source of constant anxiety in his later years. The disability and the pain he endured with characteristic bravery, but he was apprehensive lest he should lose his independence.

The end came with tragic suddenness. But such an end seems to befit the man and far to be preferred to a slow decline of that great mind.

Close by the scene of his labours there stands for all time, a tribute to the esteem in which he was held, Hamilton Russell House. Here the principles he instilled and the influence for good which he exerted will be used for his great aim in life, the alleviation of pain and suffering. For us the very walls of "The Alfred" will ever be reminders of his kindly presence, and upon them might well be written his epitaph, as of another in his native land: "*Si monumentum requiris circumspice.*"

Correspondence.

MINERS' NYSTAGMUS.

SIR: I have to thank Dr. Allen for the courtesy of his reply; his letter will be read with the greatest interest by all those brought into contact with miners' nystagmus. His reasoning is incontrovertible, but I am not completely satisfied about his facts; and unless facts are sure, deductions are fallacious.

Unfortunately, I am not familiar with the working conditions of the New South Wales mines, nor with the lighting used there. I wonder if it is not possible that some mistake has been made. It is stated: "the electric bulbs used are of 1·5 to 2·0 candle-power". It seems incredible that bulbs of so low a candle-power are manufactured for illuminating purposes; and if they are, how is it possible that managers should use them, or mine inspectors permit their use?

I am astonished that the naked light pit lamps in use in the New South Wales pits are rated as high as five candle-power; they must be different from the naked light pit lamps that were in use in the Gippsland collieries twenty years ago (and, of course, they very well might be, after that interval). I never made an illumination test with a standard candle against these lamps, but I should judge them to be not more than "one candle-power". Electric light bulbs were in use in a small portion of the "Jumbunna" coal mine, and these were of twenty-five candle-power. The only safety lamps with which I am familiar are those which were employed in the collieries in South Wales, in Britain (and this over thirty years ago). My impression of the lighting was that it was at least three times as powerful as that I found in use in the Gippsland collieries afterwards.

Turning to another matter, it is stated: "Experimental poisoning of laboratory animals with carbon monoxide gas does not produce nystagmus;" but this is no proof that poisonous gases do not produce nystagmus in man; it is not an axiom that nystagmus (if produced by poisoning at all) is necessarily produced by carbon monoxide. In this journal I have brought forward some evidence of the probability "that coal does produce a gas, or gases, which are poisonous and which are not carbon monoxide." (See "Foul-Air Malaise", THE MEDICAL JOURNAL OF AUSTRALIA, December 11, 1918.)

Yours, etc.,

A. E. TAYLOR.

Dandenong,
May 21, 1933.

PATHOLOGICAL EXAMINATION OF TUMOURS.

SIR: In their important and instructive paper published in THE MEDICAL JOURNAL OF AUSTRALIA of May 20, 1933, Dr. L. B. Bull and Dr. B. S. Hanson state: "We believe that material can be removed from any accessible neoplasm for biopsy study without prejudice to the patient."

Since the above paper has been "commended to the study of medical practitioners, particularly those in general practice" at a period when unrestricted removal of tumour tissue for biopsy study is fast becoming a fashionable procedure, a word of warning with regard to the limitations of this particular method of investigation may be not amiss.

The variation in the geographical dissemination of cancer of the breast (spheroidal-celled carcinoma) and cancer of the tongue (squamous-celled epithelioma) was well known to our forefathers and was mainly responsible for the retention of the oral diaphragm, with its collecting lymphatic trunks, when performing the "complete" operation for lingual cancer.

Further, the rarity of anything comparable to general dissemination in the latter disease is common knowledge.

Nearly a quarter of a century ago Lenthal Cheatle showed that, although the deeper muscles of the tongue were much more widely invaded than was previously thought, the larger lymphatic vessels running to regional glands were not (except, perhaps, very late in the course of the disease) involved and intermediate masses (subcutaneous nodules) were so rare as to be regarded as pathological curiosities.

It therefore follows that any application of the permeation theory to lingual cancer must be deprecated; a procedure which even Sampson Handley has not ventured to adopt.

In the subleader of *The British Medical Journal* of September 25, 1926, the following comments on Circular 716 issued by the Ministry of Health in connexion with cancer of the breast appear:

> The Committee dismisses as dangerous and inconvenient the method of removing a portion of the growth for microscopical examination. It finds that the method of examining microscopical sections during the course of an operation has proved unsatisfactory, since masses which are difficult to identify with the naked eye are very frequently those which display doubtful appearances under the rapid microscopical examination during operation.
>
> The greatest reliability and lest risk is to be found in incising the growth at the time of operation and being guided as to the subsequent procedure by the naked eye appearances of the incised tumour, every care being taken to avoid transference of cancer cells to the wound.

One is in complete agreement with the above, but the surgeon's greatest difficulty arises with small, doubtful "indurations", and one personally has come to rely more and more upon the rapid freezing method.

The nodule previously marked with skin ink is excised, the wound immediately seared with an electric cautery and packed with gauze.

The pathologist furnishes a report in from eight to twelve minutes. Two errors have occurred in a series of twenty-five "doubtful" cases, subsequent examination of the excised breast revealing areas of carcinoma in another segment.

On the other hand, with a doubtful ulcer of the tongue the accepted practice has been to remove a portion of the growth, stitch up the wound and defer any operation for a day or two until a paraffin section of the excised piece has been examined.

Although Professor James Ewing states that "the practice of removing a portion of the tumour for diagnosis may add to the dangers of local dissemination", the pathologist urges that the incisions should be made to include the edge of the ulcer and portions of both the floor and surrounding healthy tissue.

With small early carcinoma, especially if situated towards the tip or margin of the tongue, the surgeon would prefer to excise the suspected lesion with half to three-quarters of an inch of healthy margin.

Since the opinions of Dr. Bull and Dr. Hanson have been sponsored by the Fourth Australian Cancer Conference, practising surgeons are naturally anxious to learn from their pathological *confrères* what fresh evidence has become available wherewith to overthrow the findings of the Departmental Committee on Cancer of 1926.

Yours, etc.,

HARRY C. R. DARLING.

229, Macquarie Street,
Sydney,
May 24, 1933.

COAL MINER'S LUNG.

SIR: I wish to say how pleased I was to read Dr. George Willcocks's letter in the journal of May 27, 1933, on the subject of "Coal Miner's Lung".

To anyone who has been closely associated with this type of work for many years, it is most refreshing to find this subject being given some publicity.

We have realized for some years now that men may show quite marked radiographic changes in their lungs, but are not incapacitated in any way till informed that they have "dust on the lung".

I recently examined a man for compensation who had worked as a coal miner for over seventy years; he was then eighty-four years of age, and was applying for compensation for pneumonokoniosis, as he found he became a little breathless after chopping wood. No doubt if this man had been radiographed many years before, some changes would have appeared in his lungs, and if then told he had pneumonokoniosis I have no doubt he would have sat back as an interesting invalid and drawn compensation for many years, whereas it happened he was far happier at work.

Professor S. Lyle Cummins's letter will be most interesting to many members of the profession who looked at one with doubt when told that the damaging dust was silica in these conditions.

I have little doubt that the period of exposure to dust inhalation required to produce changes in the lungs varies in direct proportion to the amount of silica contained in the dust. The radiographic appearances also vary as the proportion of silica varies.

In conclusion, I wish to state that it is only by expert clinical and radiographic examination that any idea can be gained as to the man's eligibility for compensation.

Yours, etc.,

W. A. EDWARDS.

185, Macquarie Street,
Sydney,
May 31, 1933.

NASAL SINUSITIS IN RELATION TO GENERAL INFECTIONS.

SIR: I read with great interest and appreciation the excellent paper on "Nasal Sinusitis in Relation to General Infections", by Dr. Clive Eadie, of Melbourne, which was published in THE MEDICAL JOURNAL OF AUSTRALIA on May 27, 1933. I regard this paper as one of the most important contributions to the problem of nasal sinusitis and focal infections that has yet appeared in the journal, and Dr. Eadie must be warmly congratulated upon the great amount of time and effort that he must have spent in carrying out this valuable piece of research, which confirms in a very impressive way the work of Watson Williams, Dean, Graves and Pickworth, Rosenow, and the other notable workers in this field.

In the discussion that followed, however, I was disappointed to read that Dr. Sidney Pern was the only member present who mentioned the good results that could be obtained with ionization in the treatment of sinus infections. "Ionization" is the answer to Dr. Baxter's question whether there was any course of treatment, other than surgical, which offered much hope of improving chronic sinus infections. After a fifteen years' experience with this valuable method, I consider that zinc ionization is the treatment *par excellence* for clearing up rapidly subacute and chronic infections, both of the middle ear and maxillary antrum. Leduc, Friel, Jobson, Norrie, Sloan, Warwick and others have all stressed its great value in sterilizing any septic cavity that can be washed out with a 1% solution of zinc sulphate and then kept full of the solution while a weak galvanic current of electricity is passed through it for from ten to thirty minutes, according to the size of the cavity and the virulence or chronicity of the infection. After a long experience of this excellent method of treatment, which I learned from Friel himself in France during the war, I can only echo Sloan's impressive words when he said: "If in the whole realm of therapeutics there can be any certainty of success it is in the field of ionization for septic disease."

For full details of the various techniques employed in the treatment of the middle ear and accessory sinuses of the nose with ionization I would refer my colleagues to a paper entitled "Electric Ionization: Its Importance in Oto-Rhinology", which I read before the Section of Oto-Rhino-Laryngology in Sydney in July, 1928, and which was published in THE MEDICAL JOURNAL OF AUSTRALIA on September 8, 1928. I will gladly send a reprint of this paper to any of my colleagues who may not be able to locate this particular issue of the journal and who would like to give ionization a trial. A copy of Friel's manual on "Electric Ionization" should also be in the library of every ear, nose and throat specialist, and I can assure them that if they give ionization a thorough trial and pay careful attention to the details of technique which are essential for complete success, they will reduce the number of radical antrum and radical mastoid operations that they are now doing by 75%.

Yours, etc.,

A. J. CAHILL.

Civic Centre,
Canberra,
June 1, 1933.

X RAY DERMATITIS.

SIR: A patient who is suffering from mild chronic X ray dermatitis of the dorsal surface of both hands, has a number of thickened, scabby, heaped-up areas, which are painless, but unsightly. Treatment with various ointments and lotions has made no improvement to the condition, which is not malignant and not specific. Suggestions for treatment are invited.

Yours, etc.,

"MEDICUS."

May 30, 1933.

Honours.

BIRTHDAY HONOURS.

IN this year's birthday honours list there appear the names of several medical practitioners.

Dr. T. P. Dunhill, of London, has received the honour of knighthood. Sir Thomas Dunhill practised for many

years in Melbourne and is held in high esteem by the Australian Branches of the British Medical Association in Australia, which he has represented on the Council of the Parent Body.

Dr. W. Duke Elder, ophthalmic surgeon, of London, and Dr. H. T. D. Acland, of Christchurch, New Zealand, have also received the honour of knighthood.

Colonel F. A. Maguire, of Sydney, Deputy Director of Medical Services of the Second Military District, has been made a Companion of the Most Distinguished Order of Saint Michael and Saint George.

The congratulations of the medical profession are extended to Sir Thomas Dunhill, Sir W. Duke Elder, Sir Hugh Acland and Colonel Maguire.

Books Received.

MEDICAL ENTOMOLOGY, by R. Matheson, Ph.D.; 1932. London: Baillière, Tindall and Cox. Royal 8vo., pp. 503, with illustrations. Price: 29s. net.

THE COLON, RECTUM AND ANUS, by F. W. Rankin, B.A., M.A., M.D., F.A.C.S., J. A. Bargen, B.S., M.D., M.S., F.A.C.P., and L. A. Buie, B.A., M.D., F.A.C.S.; 1932. Philadelphia: W. B. Saunders Company; Melbourne, Brisbane and Christchurch: James Little and Son. Royal 8vo., pp. 846, with 435 illustrations. Price: 60s. net.

DIAGNOSIS AND TREATMENT OF DISEASES OF THE THYROID GLAND, by G. Crile and Associates; 1932. Philadelphia: W. B. Saunders Company; Melbourne, Brisbane and Christchurch: James Little and Son. Royal 8vo., pp. 508, with illustrations. Price: 40s. net.

ELECTROSURGERY, by H. A. Kelly, M.D., LL.D., F.A.C.S., and G. E. Ward, M.D., F.A.C.S.; 1932. Philadelphia: W. B. Saunders Company; Melbourne, Brisbane and Christchurch: James Little and Son. Super Royal 8vo., pp. 305, with 382 illustrations. Price: 45s. net.

ANNUAL REPORT OF THE SURGEON GENERAL OF THE PUBLIC HEALTH SERVICE OF THE UNITED STATES FOR THE FISCAL YEAR 1932; 1932. Washington: United States Government Printing Office. Demy 8vo., pp. 205. Price: $1.00 net.

Diary for the Month.

JUNE 20.—New South Wales Branch, B.M.A.: Ethics Committee.
JUNE 21.—Western Australian Branch, B.M.A.: Branch.
JUNE 22.—New South Wales Branch, B.M.A.: Clinical Meeting.
JUNE 23.—Queensland Branch, B.M.A.: Council.
JUNE 27.—New South Wales Branch, B.M.A.: Medical Politics Committee.
JUNE 28.—Victorian Branch, B.M.A.: Council.
JUNE 29.—South Australian Branch, B.M.A.: Branch.
JUNE 29.—New South Wales Branch, B.M.A.: Branch.
JULY 3.—New South Wales Branch, B.M.A.: Organization and Science Committee.
JULY 4.—New South Wales Branch, B.M.A.: Council, quarterly.
JULY 5.—Western Australian Branch, B.M.A.: Council.
JULY 5.—Victorian Branch, B.M.A.: Branch.
JULY 6.—South Australian Branch, B.M.A.: Council.
JULY 7.—Queensland Branch, B.M.A.: Branch.
JULY 11.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
JULY 14.—Queensland Branch, B.M.A.: Council.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser", page xiv.

CHILDREN'S HOSPITAL (INCORPORATED), PERTH, WESTERN AUSTRALIA: Junior Resident Medical Officers (male).

FREMANTLE HOSPITAL, FREMANTLE, WESTERN AUSTRALIA: Resident Medical Officer.

HOBART PUBLIC HOSPITAL, HOBART, TASMANIA: Junior Resident Medical Officer.

LAUNCESTON PUBLIC HOSPITAL, LAUNCESTON, TASMANIA: Resident Medical Officers.

NEWCASTLE HOSPITAL, NEWCASTLE, NEW SOUTH WALES: Junior Resident Medical Officer.

THE WOMEN'S HOSPITAL, CROWN STREET, SYDNEY, NEW SOUTH WALES: Honorary Radiologist.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phœnix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Brisbane Associated Friendly Societies' Medical Institute. Chillagoe Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL are advised, in their own interests, to submit a copy of their agreement to the Council before signing. Lower Burdekin District Hospital, Ayr.
SOUTH AUSTRALIAN: Secretary, 267, North Terrace, Adelaide.	Combined Friendly Societies, Clarendon and Kangarilla districts. All Lodge Appointments in South Australia. All Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 65, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (Wellington Division): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

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